

Docket	:	<u>A.22-02-015</u>
Exhibit Number	:	<u></u>
Commissioner	:	<u>J. Reynolds</u>
Admin. Law Judge	:	<u>S. Lee</u>
Public Advocates Office	:	<u>Karl Stellrecht</u>
Project Mgr.	:	<u></u>
Public Advocates Office	:	<u>Various</u>
Witnesses	:	



**PUBLIC ADVOCATES OFFICE  
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**PREPARED TESTIMONY  
ON  
PACIFIC GAS AND ELECTRIC COMPANY APPLICATION  
FOR COMPLIANCE REVIEW OF UTILITY OWNED  
GENERATION OPERATIONS, ELECTRIC ENERGY  
RESOURCE RECOVERY ACCOUNT ENTRIES,  
CONTRACT ADMINISTRATION, ECONOMIC DISPATCH OF  
ELECTRIC RESOURCES, UTILITY OWNED GENERATION  
FUEL PROCUREMENT, AND OTHER ACTIVITIES FOR THE  
PERIOD JANUARY 1 THROUGH DECEMBER 31, 2021 (U 39 E)**

**(PUBLIC VERSION)**

San Francisco, California  
October 31, 2022

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1 **CHAPTER 1 EXECUTIVE SUMMARY**

2 (Witness: Karl Stellrecht)

3 **I. INTRODUCTION AND RECOMMENDATIONS**

4 This testimony presents the Public Advocates Office's (Cal Advocates) review of  
5 Pacific Gas and Electric Company's (PG&E) Energy Resource Recovery Account  
6 (ERRA) Compliance Application for the period from January 1, 2021 through December  
7 31, 2021 (Record Period). PG&E filed its annual ERRA compliance application pursuant  
8 to Decision (D.) 02-10-062. In that Decision, the California Public Utilities Commission  
9 (Commission or CPUC) required certain utility procurement activities to be reviewed  
10 annually in the ERRA proceeding.

11 Pursuant to D.02-10-062, D.02-12-074 and California Public Utilities Code  
12 (PU Code) § 454.5(d)(3), the purpose of the ERRA is to record and recover power costs  
13 and ensure timely recovery of procurement costs incurred related to an investor-owned  
14 utility's approved procurement plan.<sup>1</sup> PU Code § 454.5(d)(3) allows the Commission to  
15 establish balancing accounts to track the differences between recorded revenues and costs  
16 incurred related to the approved procurement plan.<sup>2</sup>

17 PG&E filed its ERRA compliance application on March 1, 2022 requesting  
18 Commission approval for costs associated with activities that occurred during the 2021  
19 Record Period. The scope of Cal Advocates' review of PG&E's application includes a  
20 review of utility-owned generation operations, fuel expenses and procurement, contract  
21 administration, least-cost dispatch (LCD), demand response, and an audit of balancing  
22 account entries. In addition, Cal Advocates also reviewed other ERRA issues  
23 summarized below.

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<sup>1</sup> D.02-10-062, Finding of Fact (FOF) 23 and 26, pp. 71, 71 – 72.

<sup>2</sup> PUC Code §454.5(d)(3) states: "The commission shall establish power procurement balancing accounts to track the differences between recorded revenues and costs incurred pursuant to an approved procurement plan. The commission shall review the power procurement balancing accounts, not less than semiannually, and shall adjust rates or order refunds, as necessary, to promptly amortize a balancing account, according to a schedule determined by the commission."

1 In this testimony Cal Advocates presents its analyses and recommendations  
2 associated with PG&E's request. This testimony focuses exclusively on the 2021 Record  
3 Period and is based on analysis of information submitted by PG&E that includes, but is  
4 not limited to, PG&E's testimony and workpapers submitted with its application and  
5 responses to data requests.

6 The issues that Cal Advocates reviewed for the 2021 Record Period are listed in  
7 the table below and summarized in this chapter. For those issues or topic areas for which  
8 no testimony is filed, Cal Advocates does not have any recommendations or  
9 disallowances. The qualifications of Cal Advocates' witnesses and their testimony  
10 declarations are contained in Appendix A of this report.

**List of the Cal Advocates Witnesses and Respective Chapters**

<b>Chapter #</b>	<b>Description</b>	<b>Witness</b>
1	Executive Summary	Karl Stellrecht
2	Least-Cost Dispatch and Economically-Triggered Demand Response	Stanley Kuan
3	Utility-Owned Generation – Hydroelectric	Michael Yeo
4	Review Entries Recorded in the Disadvantaged Community – Green Tariff Balancing Account and the Community Solar Green Tariff Balancing Account	Brian Lui
5	Contract Administration	Patrick Cunningham
6	Resource Adequacy	Kyle Navis
7	Review Entries Recorded In The Green Tariff Shared Renewables Memorandum Account and Green Tariff Shared Renewables Balancing Account	Brian Lui
8	Summary of Portfolio Allocation Balancing Account Entries for the Record Period	Brian Lui
9	Energy Resource Recovery Account	Brian Lui

Chapter #	Description	Witness
10	Review Entries Recorded in the Disadvantaged Community – Single-Family Affordable Solar Homes Balancing Account and the Disadvantaged Community – Single-Family Affordable Solar Homes Memorandum Account	Brian Lui
11	Central Procurement Entity – Entries Recorded in the Centralized Local Procurement Sub-Account	Brian Lui

## II. SUMMARY OF FINDINGS & RECOMMENDATIONS

The following summary provides an overview of each chapter presented and sponsored by the witnesses for the 2021 Record Period. This summary is provided strictly for the reader's convenience.

### 1. Executive Summary (Karl Stellrecht)

### 2. Least-Cost Dispatch And Economically Triggered Demand Response (Stanley Kuan)

Overall, Cal Advocates finds that PG&E managed its thermal, hydro, and demand response resources reasonably and does not recommend any disallowances.

### 3. Utility-Owned Generation – Hydroelectric (Michael Yeo)

After reviewing PG&E's testimony and responses to data requests, Cal Advocates finds that PG&E prudently managed the Humboldt Bay Generating Station Unit 2 outage on February 6, 2021, and performed the appropriate corrective actions:

- 1) The Utility promptly replaced the failed programmable logic controller (PLC) and restored the Unit back in service.
- 2) Beyond restoration of the Unit, PG&E took steps to stock, for all the ten units, spare PLCs as part of its corrective actions and preprogrammed the equipment.

This proactive action of PLC procurement and preprogramming should reduce the downtime if another PLC fails. For the February 6, 2021 outage, four to five days were lost to program the spare PLC. Furthermore, were it not for the availability of the spare PLC, additional time would have been incurred to procure one. This reduction of time to restore electric generation saved ratepayers the additional cost of replacement power.

1           **4.     Review Entries Recorded In The Disadvantaged Community –**  
2           **Green Tariff Balancing Account And The Community Solar**  
3           **Green Tariff Balancing Account (Brian Lui)**

4           Cal Advocates’ review of the GTSRMA and GTSRBA for the 2021 Record Period  
5           found no required accounting adjustments, and Cal Advocates does not object to the costs  
6           recorded in the GTSRMA and GTSRBA. Cal Advocates found that the 2021 GTSRMA  
7           administrative and outreach expenses are reasonable, appropriate, correctly stated, and in  
8           compliance with applicable Commission Decisions. Cal Advocates found that the 2021  
9           GTSRBA is in compliance with the applicable tariffs and Commission directives.

10          **5.     Contract Administration (Patrick Cunningham)**

11          With the exception of PG&E’s failure to correctly administer the Vantage Wind  
12          Energy Center power purchase agreement (PPA), Cal Advocates finds that PG&E has  
13          reasonably and prudently conducted its contract administration for the 2021 Record  
14          Period. Cal Advocates recommends the Commission disallow recovery of lost payments  
15          for the Vantage PPA totaling [REDACTED]

16          **6.     Resource Adequacy (Kyle Navis)**

17          Overall, Cal Advocates finds that PG&E’s efforts to procure and sell RA in its  
18          solicitations were in compliance with the requirements of PG&E’s BPP.

19          **7.     Review Entries Recorded In The Green Tariff Shared**  
20          **Renewables Memorandum Account And The Green Tariff**  
21          **Shared Renewables Balancing Account (Brian Lui)**

22          Cal Advocates’ review of the GTSRMA and GTSRBA for the 2021 Record Period  
23          found no required accounting adjustments, and Cal Advocates does not object to the costs  
24          recorded in the GTSRMA and GTSRBA. Cal Advocates found that the 2021 GTSRMA  
25          administrative and outreach expenses are reasonable, appropriate, correctly stated, and in  
26          compliance with applicable Commission Decisions. Cal Advocates found that the 2021  
27          GTSRBA is in compliance with the applicable tariffs and Commission directives.

28          **8.     Summary Of Portfolio Allocation Balancing Account Entries**  
29          **For The Record Period (Brian Lui)**

30          Cal Advocates found that the 2021 accounting entries recorded into PABA were  
31          reasonable, correctly stated, and in compliance with applicable Commission Decisions.

Cal Advocates recommends the 2021 accounting entries recorded into PABA be accepted as filed.

**9. Summary Of Energy Resource Recovery Account Entries For The Record Period (Brian Lui)**

Cal Advocates found that the 2021 accounting entries recorded into ERRRA were reasonable, correctly stated, and in compliance with applicable Commission Decisions.

**10. Review Entries Recorded In The Disadvantaged Community – Single-Family Affordable Solar Homes Balancing Account And The Disadvantaged Community – Single-Family Affordable Solar Homes Memorandum (Brian Lui)**

Cal Advocates recommends the DACSASHBA be accepted as filed.

Cal Advocates does not object to PG&E retiring the DACSASHMA.

**11. Central Procurement Entity – Entries Recorded in the Centralized Local Procurement Sub-Account (Brian Lui)**

Cal Advocates recommends the CPE administrative costs recorded in the CLPSA for the 2021 Record Period be accepted as filed.

1 **CHAPTER 2 LEAST-COST DISPATCH AND**  
2 **ECONOMICALLY-TRIGGERED DEMAND RESPONSE**

3 (Witness: Stanley Kuan)

4 **I. INTRODUCTION AND SUMMARY**

5 This chapter of testimony reviews Pacific Gas and Electric Company's (PG&E)  
6 dispatch and demand response<sup>3</sup> activities for the Record Period from January 1, 2021,  
7 through December 31, 2021, and considers whether PG&E met the Commission's least-  
8 cost dispatch standard. Cal Advocates examined Chapter 1 of PG&E's 2021 Energy  
9 Resource Recovery Account (ERRA) compliance testimony and workpapers and  
10 reviewed past ERRA testimonies. Both PG&E's energy scheduling and demand response  
11 dispatch decisions were reviewed using the least-cost dispatch standard of review, as  
12 described below.

13 **II. FINDINGS AND RECOMMENDATIONS**

14 **A. Assessment of Overall Forecasting Accuracy**

- 15 • Overall, PG&E's day-ahead forecasts during Record Period 2021  
16 were [REDACTED] those in Record Period 2020.  
17 However, the independent review performed in 2018 on PG&E's  
18 load and price forecasting methodologies provided Cal  
19 Advocates with a baseline for the quality and robustness of  
20 PG&E's forecasting tools and methods.
- 21 • Due to the minimal amount of variation in PG&E's load and  
22 price forecast accuracy over the past few record periods, Cal  
23 Advocates finds PG&E's load and price forecasting activities in  
24 the 2021 Record Period to be reasonable.

25 **B. Load Bid Calculations**

- 26 • The proportion of load cleared in the real-time market (RTM) in  
27 Record Period 2021 was slightly lower than in the 2020 Record  
28 Period. Cal Advocates finds PG&E has demonstrated that its  
29 load bidding calculations are reasonable.

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<sup>3</sup> PG&E manages several types of Demand Response programs, but the LCD chapter, and therefore Cal Advocates' analysis, focuses on demand response resources with economic dispatch triggers.

1           **C.      Assessment of Management of Thermal Resources**

- 2           • One<sup>4</sup> of PG&E’s submitted bids had a significant variance  
3           between the calculated and correct bids of greater than \$0.10  
4           resulting in a 0.28% error rate.<sup>5</sup> As a corrective action, PG&E  
5           reinforced its bid creation and validation processes with its  
6           analysts. Cal Advocates finds PG&E’s bid cost calculation  
7           activities to be reasonable.
- 8           • In the 2021 Record Period, there were four<sup>6</sup> “bidding and  
9           scheduling events” that resulted in total cost impacts of \$7,184.<sup>7</sup>  
10          Because PG&E addressed these events relatively quickly and  
11          they did not reoccur, PG&E avoided potentially higher cost  
12          impacts.
- 13          • In the 2021 Record Period, PG&E experienced a one-time IT  
14          error that resulted in the self-commitment of 2 units that totaled  
15          581.7 megawatt-hour (MWh) and did not result in any cost  
16          impacts.<sup>8,9</sup> All other instances of self-commitment were for non-  
17          discretionary purposes (e.g., testing).<sup>10</sup>

18           **D.      Assessment of Management of Hydroelectric Resources**

- 19          • Overall, PG&E has demonstrated that it is bidding its hydro  
20          resources for dispatch according to least-cost dispatch principles,  
21          during times when the price and value of energy is high.

22           **E.      Assessment of Demand Response Programs**

- 23          • Based on the average hourly price at the Sub-Load Aggregation  
24          Point (Sub-LAP) for instances in which a Capacity Bidding  
25          Program (CBP) or SmartAC resource was dispatched versus the  
26          average hourly Sub-LAP price for all instances in which the  
27          trigger condition was met, PG&E optimized its CBP and  
28          SmartAC resources reasonably.

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<sup>4</sup> A.21-03-008, Chapter 1 Workpapers, 2020\_LCD\_2\_Bid\_Cost\_Calculation\_CONF, “CLEAN\_VS\_CALC” tab.

<sup>5</sup> A.21-03-008, Chapter 1 Workpapers, 2020\_LCD\_2\_Bid\_Cost\_Calculation\_CONF, Table 2.1.2-Annual Comparison.

<sup>6</sup> A.22-02-015, PG&E Testimony, p. 1-29.

<sup>7</sup> A.22-02-015, PG&E Testimony, p. 1-29.

<sup>8</sup> A.21-03-008, PG&E Testimony, p. 1-27.

<sup>9</sup> A.21-03-008, Chapter 1 Workpapers, 2020\_LCD\_3\_SelfCommitment\_CONF.

<sup>10</sup> A.21-03-008, PG&E Testimony, p. 1-27.

1   **III.   BACKGROUND**

2           **A.    Standard of Conduct for Least-Cost Dispatch and Demand**  
3           **Response**

4           The Commission’s Decision (D.) 02-10-062 instituted rules for the utilities’  
5 procurement responsibilities, established ERRRA as the cost recovery mechanism for  
6 short-term procurement costs, and set minimum standards of behavior.<sup>11</sup> A subsequent  
7 decision, D.02-12-074, described the utilities’ “up-front standard”<sup>12</sup> of least-cost dispatch  
8 as a guide for their short-term procurement plans as well as for the Commission to  
9 determine compliance. The decision elaborated upon Standard of Conduct #4:

10           Least-cost dispatch refers to a situation in which the most cost-  
11 effective mix of total resources is used, thereby minimizing the cost  
12 of delivering electric services...[P]ure economic dispatch of  
13 resources may need to be constrained to satisfy operational, physical,  
14 legal, regulatory, environmental, and safety considerations. The  
15 utility bears the burden of proving compliance with the standard set  
16 forth in its plan.<sup>13</sup>

17           In the settlement agreement resulting from PG&E’s 2014 Record Period ERRRA  
18 compliance proceeding, Cal Advocates, then the Office of Ratepayer Advocates,<sup>14</sup> and  
19 PG&E agreed that the Commission would review economically dispatched demand  
20 response programs and hold PG&E to the least-cost dispatch standard of review  
21 described above.<sup>15</sup>

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<sup>11</sup> D.02-10-062, p. 2.

<sup>12</sup> D.02-12-074, p. 54.

<sup>13</sup> D.02-12-074, p. 54.

<sup>14</sup> The Office of Ratepayer Advocates was renamed the Public Advocates Office of the Public Utilities Commission Pursuant to Senate Bill No. 854, which was signed by the Governor on June 27, 2019 (Chapter 51, Statutes of 2019).

<sup>15</sup> D.16-12-045, Conclusion of Law 4, p. 31.

1           **B.      Clarification of Least-Cost Dispatch Expectations Following**  
2                   **PG&E’s 2010 Record Period and Southern California Edison’s**  
3                   **2012 Record Period Erra Compliance Proceedings**

4           The Commission reviewed PG&E’s least-cost dispatch showing in Application  
5 (A.) 11-02-011 and issued D.13-10-041, stating that while the Commission would not  
6 approve the disallowance recommendation, the showing was below expectations.<sup>16</sup> To  
7 improve least-cost dispatch showings, the Decision directed PG&E to include “precise  
8 numerical calculations that either demonstrate that PG&E achieved least-cost dispatch  
9 during the Record Period or quantify the amount of overspending by PG&E” in its 2014  
10 Erra compliance proceeding (and going forward).<sup>17</sup> Additionally, the Decision directed  
11 the Commission’s Energy Division to facilitate a workshop with all investor-owned  
12 utilities, wherein a set of proposed criteria would be developed for determining what  
13 constitutes least-cost dispatch compliance and the methodology required to demonstrate  
14 this compliance.<sup>18</sup>

15           **C.      Joint Proposal, Interim Ruling, and Final Decision for**  
16                   **A.11-02-011**

17           After the workshops, the utilities and subject matter experts proposed least-cost  
18 dispatch criteria and methodologies and submitted them to the Commission in 2014 as  
19 the “Joint Proposal for the Demonstration of Least-Cost Dispatch” (Joint Proposal).<sup>19</sup> In  
20 2015, the Commission issued a decision adopting the standards in the Joint Proposal<sup>20</sup>  
21 and directed the utilities to comply with the uncontested portions, which are as follows:

- 22           i.    The least-cost dispatch Proposal shall be modified to include  
23               a background summary table in testimony.
- 24           ii.   The utilities shall use the 500 instead of 100 highest hourly  
25               Locational Marginal Prices in metric 4 of the Joint Proposal.

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<sup>16</sup> D.13-10-041, p. 14-15.

<sup>17</sup> D.13-10-041, p. 43.

<sup>18</sup> D.13-10-041, p. 25.

<sup>19</sup> D.15-05-006, p. 7.

<sup>20</sup> D.15-12-015.

- 1           iii.    The summary reporting of daily self-commitment decisions  
2               shall be modified to show both “profit positions” and “loss  
3               positions.”
- 4           iv.    The utilities shall include a comparison of the accuracy of the  
5               utilities’ forecast of prices in the day-ahead market compared  
6               to actual CAISO results.<sup>21</sup>

#### 7   **IV.   DISCUSSION AND ANALYSIS**

8           Cal Advocates’ analysis is organized to assess the following elements of PG&E’s  
9   least-cost dispatch and demand response testimony: the accuracy of PG&E’s overall  
10   forecasting accuracy and load bid calculations, dispatch of thermal resources, dispatch of  
11   hydro resources, and dispatch of demand response programs.

##### 12           **A.   Overall Forecasting Accuracy**

##### 13               **1.   Overview**

14           PG&E conducts load and price forecasts to support its day-ahead market bidding  
15   and to procure fuel to supply its thermal resources. The load forecast is performed seven  
16   days in advance and is based on temperatures and actual hourly-updated load data. The  
17   price forecast is intended to reflect energy demand given market dynamics of supply,  
18   congestion, solar concentration, and transmission-constrained local area differences. This  
19   forecast also enables PG&E to evaluate the opportunity costs of use-limited dispatchable  
20   resources, such as hydroelectric powerhouses. Finally, PG&E combines the load  
21   (supply) with the price (demand) forecasts to predict market clearing prices and the  
22   marginal cost of providing energy during the optimization process, which informs the  
23   price of resources bid into the CAISO’s day-ahead market.<sup>22</sup>

24           PG&E’s day-ahead forecast accuracy can be determined by comparing the load  
25   and price forecasts with the actual CAISO load and clearing price to get the average  
26   mean absolute percentage error (MAPE), which is a measure of the forecast price  
27   deviation from the actual clearing price. This information is provided in PG&E’s  
28   testimony in its comparison of forecast and actual price and load for the 100 highest

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<sup>21</sup> D.15-05-006, p. 12.

<sup>22</sup> Trading floor tour during Cal Advocates’ site visit to PG&E office on March 16, 2016.

energy value days (ranked based on the total cost of the load cleared in the day-ahead market)<sup>23</sup> as well as for every day of the Record Period.<sup>24</sup> In addition to verifying forecast accuracy, the MAPE analysis provides insight into how well PG&E values its dispatchable resources to ensure that they are bid economically consistent with least-cost dispatch principles.

**a. Analysis**

According to PG&E, a MAPE value of up to 10% is “normal” and is more likely to be higher on hotter days with higher energy values.<sup>25</sup> In the 2021 Record Period, among the 100 highest energy value days, the median price MAPE was 11.52% and the mean was 15.27%.<sup>26</sup> This is relatively close to the 2020 values, when the median price MAPE was 11.18% and the mean was 15.78%.<sup>27</sup>

The mean and median price MAPE values for all 365 days of the year are [REDACTED] than the average MAPE values for the 100 highest energy value days in 2021; for every day in 2021, the median MAPE was [REDACTED] and the mean was [REDACTED].<sup>28</sup> The 2020 Record Period median MAPE for every day was also lower than the 2020 median MAPE for the 100 highest energy value days. In contrast, the 2019 Record Period median MAPE for every day of the year was higher than the 2019 median MAPE for the 100 highest energy value days.<sup>29</sup> The mean and median price MAPE values for every day of 2021 are lower than in 2020, when the median MAPE value was [REDACTED] and the mean

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<sup>23</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_6\_Highest\_Energy\_Value\_Days\_and\_Price\_Forecast\_Summary\_CONF.

<sup>24</sup> A.22-02-015, Chapter 1 Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.

<sup>25</sup> Presentation of LCD chapter and workpapers during Cal Office’ site visit to PG&E office on March 16, 2016.

<sup>26</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, Table 6.1.

<sup>27</sup> A.21-03-008, Chapter 1 Workpapers, 2020\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, Table 6.1.

<sup>28</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, Table 6.2.

<sup>29</sup> A.20-02-009, Chapter 1 Workpapers, 2019\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, Table 6.2.

was [REDACTED].<sup>30</sup> The mean MAPE values for every day of the year for 2019, 2020, and 2021 were [REDACTED] than what PG&E considers normal (up to 10%). The median MAPE values for every day of 2019 and 2020 were also [REDACTED] than the normal threshold, though for 2021, the median MAPE was [REDACTED] the normal range (less than 10%). Table 1 below presents the data more clearly.

**Table 1: Mean and Median Price MAPE Values for 2019, 2020, 2021 (Confidential)**

	2019	2020	2021
MAPE for top 100 energy value days	[REDACTED]	[REDACTED]	[REDACTED]
Median MAPE for top 100 energy value days	[REDACTED]	[REDACTED]	[REDACTED]
MAPE for every day of the year	[REDACTED]	[REDACTED]	[REDACTED]
Median MAPE for every day of the year	[REDACTED]	[REDACTED]	[REDACTED]

There are many reasons why forecasts can be more and less accurate, and, with utility load departure to community choice aggregation, volatile natural gas prices, and climate change, the future of California’s electricity market is uncertain. To evaluate and assess the robustness of PG&E’s load and price forecast models, in 2018 PG&E and Cal Advocates agreed to an independent review by a third-party reviewer, Dr. Derek Bunn of the London Business School. Dr. Bunn determined that PG&E made “careful use of the external forecasting services,” and PG&E’s choice in vendor for providing these external forecasting services “was a good one and there is no evidence that a better vendor service could have been procured.”<sup>31</sup> Further, Dr. Bunn determined that the vendor, Pattern Recognition Technologies (PRT),

<sup>30</sup> A.20-02-009, Chapter 1 Workpapers, 2019\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, Table 6.2.

<sup>31</sup> Bunn, Derek, “Independent Review of PG&E’s Load and Price Forecasting Processes and Performance.” June 8, 2018, p.17.

1 Has developed a reputable, state-of-the-art methodology and  
2 produces robust forecasts, has an active model management  
3 process in place and is responsive to client concerns.<sup>32</sup>

4 Dr. Bunn's full report on PG&E's forecasting models was presented and evaluated  
5 by Cal Advocates in its 2018 Record Period ERRA Compliance opening testimony.<sup>33</sup>

6 **b. Summary and Recommendations**

7 Overall, PG&E's day-ahead forecasts for every day of the year during Record  
8 Period 2021 were slightly [REDACTED] those in Record Period 2020 and 2019.  
9 PG&E's day-ahead forecasts for top 100 energy value days were slightly [REDACTED]  
10 [REDACTED] those in Record Period 2020 and 2019. However, the independent review noted  
11 earlier provided Cal Advocates with a baseline for the quality and robustness of PG&E's  
12 forecasting tools and methods.

13 During the 2021 Record Period, most of the high daily MAPEs occurred when  
14 hourly prices dropped to very low values during low load Spring months and when prices  
15 increased to abnormally high values during the severe winter storm across the central and  
16 mid-continent United States that occurred in February.<sup>34</sup> PG&E notes that, in general,  
17 forecast algorithms are trained to perform well on average, though extreme prices are  
18 difficult to forecast.<sup>35</sup> [REDACTED] was also observed on a  
19 single day on June 18 when PG&E's Forecasted DAM DLAP Price on that day was  
20 [REDACTED] and the Average of Cleared ISO DAM DLAP Price for the PG&E Area on that  
21 day was [REDACTED].<sup>36</sup> The Average Forecasted DAM DLAP Price for each of the three days  
22 before and each of the three days after range between [REDACTED]. The Average of  
23 Cleared ISO DAM DLAP Price for the PG&E Area for each of the three days before and

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<sup>32</sup> Bunn, Derek, "Independent Review of PG&E's Load and Price Forecasting Processes and Performance." June 8, 2018, p. 17.

<sup>33</sup> A.18-02-015, Public Advocates Office Testimony, pp. 2-11- 2-14.

<sup>34</sup> A.22-02-015, Chapter 1 Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.

<sup>35</sup> A.22-02-015, Chapter 1 Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.

<sup>36</sup> A.22-02-015, Chapter 1 Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.

each of the three days after range between [REDACTED].<sup>37</sup> Cal Advocates conducted discovery to determine the reasons for the large June 18 MAPE value. PG&E's vendor explained that the high forecasted price was "[m]ostly due to higher-than-average temperatures forecasted for the NP-15 region for 6/17 & 6/18."<sup>38</sup> Figure 1 illustrates the relatively higher MAPEs that correspond with the low price values during low load Spring months and high values in February, as well as the June 18 date.

**Figure 1: Average Forecasted DAM DLAP Price and Cleared ISO DAM DLAP Price with MAPE Values for 2021 (Confidential)<sup>39</sup>**



<sup>37</sup> A.22-02-015, Chapter 1 Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.

<sup>38</sup> ERR-2021-PGE-Compliance\_DR\_CalAdvocates\_019-Q002, July 25, 2022.

<sup>39</sup> Public Advocates Office Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, "Volatility" tab.

Figure 2 below illustrates the relationship between the Average Cleared ISO DAM DLAP Price volatility, represented by a 7-day standard deviation (red line),<sup>40</sup> and the forecast accuracy of PG&E's predictive algorithm, represented by the daily MAPE of the Forecasted DAM DLAP Price (blue bar). Standard deviation can be used to measure market volatility, measuring how widely prices are dispersed from the average price. Figure 2 uses a 7-day rolling standard deviation which takes the 7-day trailing average of Cleared ISO DAM DLAP prices using the price on a particular day, along with the price from the prior 6 days. That trailing 7-day average price is then used to calculate the standard deviation for the particular day.<sup>41</sup>

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<sup>40</sup> A standard deviation is a measure of how dispersed the data is in relation to the mean. Low standard deviation means data are clustered around the mean, and high standard deviation indicates data are more spread out. The chart uses a 7-day rolling standard deviation for a particular day which is calculated using the 7-day rolling period of cleared ISO DAM DLAP price data for the particular day and prior 6 days. See Public Advocates Office Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, "Volatility" tab.

<sup>41</sup> Standard deviation was derived using Excel function STDEV, and is derived by 1) determining the mean of the ISO DAM DLAP price data for the 7 day period; 2) calculating the difference between each of the 7 day's price and the mean price; 3) squaring the differences (i.e., deviations); 4) adding the squared differences for all 7 days; and 5) dividing the sum of the squared differences by 7, the number of data points.

**Figure 2: 7-Day Rolling Standard Deviation versus MAPE of PG&E’s Forecasted DAM DLAP Price (Confidential)<sup>42</sup>**



Figure 2 shows, in general, that during days and periods with low price-volatility as represented by the 7-day standard deviation, the forecasting error and MAPE were also relatively low. However, there were periods of relatively low price-volatility from March to May where the forecasting error remained elevated. This would suggest that not all forecasting error was a result of extreme prices. PG&E attributes the forecasting error to unusually low load during the Spring season. Figure 3 shows the correlation between the MAPE (forecasting error) and standard deviation of price (price volatility) during different periods of the 2021 Record Period. Correlation is a statistical measure that expresses the extent to which two variables are linearly related or change together at a constant rate.<sup>43</sup>

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<sup>42</sup> Public Advocates Office Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, “Volatility” tab.

<sup>43</sup> Correlation can be measured as a coefficient with values ranging between -1.0 and 1.0. A correlation of 1.0 indicates a perfect positive correlation, i.e., a relationship between two variables that move together in

**Figure 3: Correlation of MAPE to 7-Day Standard Deviation  
of ISO DAM DLAP Price (Confidential)<sup>44</sup>**



On average, there is a high degree of correlation (0.6526) between the forecasting error and price volatility over the 2021 Record Period. During the January through April 2021 months, forecasting error was highly correlated (.7920) with price volatility. However, during every other part of the year, forecasting error exhibited a weak to moderate correlation to price volatility. This suggests that during certain periods or seasons of the year, price volatility did not significantly contribute to forecasting error.

However, in general, the average MAPE values for the 100 highest energy value days and average MAPE values for all 365 days for the 2021 Record Period are in line with PG&E's historical values. Given the relatively minimal amount of variation in PG&E's load and price forecast accuracy over the past few record periods, Cal Advocates finds PG&E's load and price forecasting activities for the 2021 Record Period to be reasonable and in line with its historical performance.

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the same direction, increasing or decreasing exactly in tandem. A correlation of -1.0 indicates a perfect negative correlation, i.e., a relationship between two variables that move exactly opposite to each other. A correlation of 0 indicates no correlation between two variables. Generally, a correlation coefficient value between +/-0.5 and +/-1.0 is considered to be a strong correlation and a correlation coefficient value between +/-0.3 and 0 is considered to be a weak correlation.

<sup>44</sup> Public Advocates Office Workpapers, 2021-LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF, "Volatility" tab.

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PG&E's load summary shows the total

Based on this data, [REDACTED] of PG&E's total load was cleared in the day-ahead

<sup>45</sup> A.22-02-015, PG&E Testimony, p. 1-13.

<sup>46</sup> A.22-02-015, Chapter 1 Workpapers, 2021 LCD Workpaper 7 Load Bid CONF.xlsx.

<sup>47</sup>A.21-03-008, Chapter 1 Workpapers, 2020 LCD Workpaper 7 Load Bid CONF.

<sup>48</sup> Public Advocates Office Workpapers, 2015-2021 Load Bid CONF.

**Figure 4: Percent of Load Cleared in the Real-Time market from 2015-2021**  
**(Confidential)<sup>49</sup>**



PG&E's load and price forecasting methodologies were independently reviewed by Dr. Bunn, deemed "reputable," and found to produce "robust" outcomes. The proportion of load cleared in the RTM for the 2021 Record Period versus the 2020 Record Period indicates in the efficacy of PG&E's load bidding strategy. It is notable that between 2015 and 2021, PG&E served a decreasing amount of day-ahead market load.<sup>50</sup> Therefore, Cal Advocates finds PG&E's load bidding calculations reasonable, resulting in reasonable prices for ratepayers.

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<sup>49</sup> Public Advocates Office Workpapers, 2015-2021 Load Bid\_CONF.

<sup>50</sup> Public Advocates Office Workpapers, 2015-2021 Load Bid\_CONF.

## **C. Management of Thermal Resources**

PG&E is required to bid its utility-retained and contracted thermal resources at their incremental (marginal) costs, subject to safety, regulatory, legal, operational, and financial requirements. PG&E is prohibited from taking any actions that result in a preference for its utility-retained thermal generation resources relative to those under contract with outside counterparties.<sup>51</sup>

### **1. Commitment Cost Decisions**

Prior to April 1, 2019, if the utilities believed that the proxy bids did not adequately reflect the true costs of running a resource, they could use the registered cost option. However, beginning on April 1, 2019, the CAISO “retired” the registered cost option,<sup>52</sup> except for “resources that have less than 12 months of 15-minute [locational marginal price] data.”<sup>53</sup> In the 2021 Record Period, none of PG&E’s thermal resources met the registered cost exception (resources that have less than 12 months of 15-minutes data).<sup>54</sup>

Therefore, due to the retirement of the registered cost option, PG&E did not use this option for any of its resources in 2021,<sup>55</sup> which eliminated the need for PG&E to make a Proxy/Registered cost determination for thermal resources during the 2021 Record Period. It also eliminated the need for Workpaper 1- Commitment Cost Decisions.<sup>56</sup>

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<sup>51</sup> D.02-12-069, pp. 62-63.

<sup>52</sup> CAISO Commitment Cost Enhancements Phase 3 initiative implemented on April 1, 2019.

<sup>53</sup> A.22-02-015, PG&E Testimony, p. 1-15.

<sup>54</sup> A.22-02-015, PG&E Testimony, p. 1-15.

<sup>55</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_Workpaper\_1\_CommitmentCostDecisions, Table 1.1.

<sup>56</sup> A.22-02-015, PG&E Testimony, p. 1-15.

## 2. Incremental Bid Cost Calculations

PG&E schedules or bids<sup>57</sup> resources that have dispatch flexibility into the CAISO markets at the incremental cost of providing energy, considering the variable resource operating cost and the most current market price forecast.<sup>58</sup> Resource costs that increase or decrease with resource output are properly treated as incremental costs.<sup>59</sup> Incremental energy bid costs include costs that vary directly with the generation of each additional megawatt-hour (MWh) above the minimum operating point such as fuel costs, greenhouse gas (GHG) costs, and variable operations and maintenance (VOM) costs.<sup>60</sup> Optimally, PG&E submits its calculated bids to the CAISO's day-ahead market, and the CAISO will dispatch the resource if the bid price is less than or equal to the locational marginal price (LMP) that the CAISO calculated for the node at which the resource is located. If PG&E's bid is higher than the LMP at a resource's node, the CAISO does not dispatch the resource. CAISO has the discretion whether to dispatch a resource regardless of the bid price if CAISO determines it is necessary to meet demand based on its exclusive information about the grid.

PG&E submitted [REDACTED] day-ahead hourly bids to the CAISO for its thermal resources.<sup>61</sup> [REDACTED]

[REDACTED]<sup>62</sup> [REDACTED]  
[REDACTED]<sup>63</sup> [REDACTED]  
[REDACTED]<sup>64</sup> The error rate for 2021

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<sup>57</sup> Schedules commonly refer to self-schedules whereas bids refer to price-quantity offers to sell or buy in the CAISO Market. (A.21-03-008, PG&E Testimony, p. 1-7, footnote 12).

<sup>58</sup> A.22-02-015, PG&E Testimony, p. 1-8.

<sup>59</sup> A.22-02-015, PG&E Testimony, p. 1-8.

<sup>60</sup> A.22-02-015, PG&E Testimony, p. 1-9.

<sup>61</sup> A.22-05-015, Chapter 1 Workpapers, 2021\_LCD\_2\_Bid\_Cost\_Calculation\_Summary.

<sup>62</sup> A.22-05-015, Chapter 1 Workpapers, 2021\_LCD\_2\_Bid\_Cost\_Calculation\_Summary.

<sup>63</sup> A.22-05-015, Chapter 1 Workpapers, 2021\_LCD\_2\_Bid\_Cost\_Calculation\_Summary.

<sup>64</sup> A.22-05-015, Chapter 1 Workpapers, 2021\_LCD\_2\_Bid\_Cost\_Calculation\_Summary.

1 was relatively in line with prior record years and resulted in minimal cost. As a  
2 corrective action, PG&E reinforced its bid creation and validation processes with its  
3 analysts. Cal Advocates finds PG&E's bid cost calculation activities to be reasonable.

### 4 **3. Bidding Activity**

5 As stated above, PG&E bids all available resources into the market at their  
6 incremental cost, and if the LMP is greater than or equal to the bid price, the CAISO will  
7 dispatch the resource. PG&E's testimony and workpapers detail instances when  
8 resources were not bid into the CAISO markets or, if bid, were not awarded despite the  
9 bid price falling below the LMP.

10 Among the [REDACTED] hourly bids that PG&E submitted to the CAISO for its  
11 thermal resources, [REDACTED] were "flagged," meaning that they were not dispatched  
12 although the incremental bid cost was lower than the LMP.<sup>65</sup> For all instances, the non-  
13 award was justifiable because the resource was providing ancillary services, receiving  
14 regulation awards, was a multi-stage generator, and was transitioning from one  
15 configuration to another, or all or part of the resource had an outage card,<sup>66</sup> limiting its  
16 available capacity.

17 In the 2021 Record Period, there were [REDACTED]<sup>67</sup> "bidding and scheduling events" that  
18 resulted in a total cost impacts of [REDACTED].<sup>68</sup> The first event [REDACTED]  
19 [REDACTED].<sup>69</sup> The error  
20 was the result of a programming error in a scheduling tool, where PG&E submitted  
21 slightly higher day ahead schedules than intended.<sup>70</sup> The total cost impact of this event

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<sup>65</sup> A.22-05-015, Chapter 1 Workpapers, 2021\_LCD\_Workpaper\_2\_BidCostCalculation\_CONF, Table 2.2-Annual Non-Award.

<sup>66</sup> PG&E submits bids for resources even during outage periods to prevent traders from forgetting to bid the resource once it is operational again. The outage card communicates to the CAISO that although a bid has been submitted, the resource is either fully or partially unavailable. (A.16-02-019, PG&E response to the Public Advocates Office Data Request 012, Question 3.)

<sup>67</sup> A.22-02-015, PG&E Testimony, p. 1-29.

<sup>68</sup> A.22-02-015, PG&E Testimony, p. 1-29.

<sup>69</sup> A.22-02-015, PG&E Testimony, p. 1-29.

<sup>70</sup> A.22-02-015, PG&E Testimony, p. 1-29.

1 was [REDACTED]<sup>71</sup> The second event was the result of [REDACTED]<sup>72</sup> where [REDACTED]  
2 [REDACTED]  
3 [REDACTED]<sup>73</sup> The [REDACTED]  
4 was the result of [REDACTED] that prevented bids from being awarded to the intended  
5 amount on one trade day that led to a cost impact of [REDACTED]<sup>74</sup> The [REDACTED]  
6 [REDACTED]  
7 [REDACTED]<sup>75</sup> [REDACTED]  
8 [REDACTED]<sup>76</sup>

9 To remedy these events, [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]<sup>77</sup> Because these events were  
13 remedied and did not reoccur, PG&E mitigated potentially higher cost impacts.  
14 Therefore, Cal Advocates finds that PG&E acted as a reasonable manager and does not  
15 recommend a disallowance.

16 Finally, during the 2021 Record Period, PG&E did not have any resources that did  
17 not bid into the CAISO markets at times when they were available,<sup>78</sup> which indicates that  
18 PG&E bid all of its available resources into the market, alleviating possible outages and  
19 contractual constraints.

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<sup>71</sup> A.22-02-015, PG&E Testimony, Table 1-7, p. 1-29.

<sup>72</sup> A.22-02-015, PG&E Testimony, p. 1-30.

<sup>73</sup> A.22-02-015, PG&E Testimony, p. 1-30.

<sup>74</sup> A.22-02-015, PG&E Testimony, p. 1-30.

<sup>75</sup> A.22-02-015, PG&E Testimony, p. 1-30.

<sup>76</sup> A.22-02-015, PG&E Testimony, Table 1-7, p. 1-29.

<sup>77</sup> A.22-02-015, PG&E Testimony, p. 1-30.

<sup>78</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_Workpaper\_2\_BidCostCalculation\_CONF, “Table 2.5 – Annual Non-Bid” tab.

#### 4. Must-Take Resource Bidding and Scheduling

Part of PG&E's supply portfolio comprises must-take resources,<sup>79</sup> which are subject to safety, environmental, licensing, regulatory, or contractual constraints.<sup>80</sup> Rather than submit hourly economic bids to the CAISO for these resources, as is the case with most of the dispatchable thermal and hydro resources discussed in this chapter, PG&E self-schedules the "inflexible" generation (must-take) supply in the day-ahead market based on its forecast of their generation, and then modifies these self-schedules in real-time if the forecast of generation changes.<sup>81</sup> In the 2021 Record Period, PG&E self-committed one dispatchable thermal resource to support system reliability. There were no incidences of erroneous self-commitment during the record period.<sup>82</sup> Therefore, Cal Advocates finds PG&E's management of must-take resources reasonable.

#### D. Management of Hydro Resources

##### 1. Overview

In general, hydro generation is use-limited due to the limited availability of water.<sup>83</sup> While water in reservoirs from natural inflows may be considered a zero-cost fuel (except in the case of pumped storage hydro), the availability of this zero-cost fuel may be limited.<sup>84</sup> While some hydro resources cannot be controlled at all, such as run-of-river resources, other hydro resources can be stored behind a dam and are bid into the CAISO markets at their incremental costs. Hydro resources do not have explicit fuel costs as thermal resources do, and so, while the incremental cost of providing

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<sup>79</sup> PG&E's must-take resources include (i.) existing Qualifying Facilities, (ii.) Combined Heat and Power facilities, (iii.) renewable energy contracts and resources without bidding rights for economic dispatch, (iv.) Diablo Canyon nuclear power plant, (v.) legacy contracts, and (vi.) must-run hydro generation. (A.22-02-015, PG&E Testimony, pp.1-23-24).

<sup>80</sup> A.22-02-015, PG&E Testimony, p. 1-10.

<sup>81</sup> A.22-02-015, PG&E Testimony, p. 1-10.

<sup>82</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_3\_SelfCommitment\_Summary\_CONF.

<sup>83</sup> A.21-03-008, PG&E Testimony, p. 1-14.

<sup>84</sup> A.22-02-015, PG&E Testimony, pp. 1-15-16.

1 hydropower does not include fuel, utilities must consider the opportunity costs of  
2 utilizing the resource at a future time when it may be more valuable.

3 Least-cost dispatch of hydro resources must take into consideration the uncertainty  
4 of weather conditions such as the likelihood of precipitation and high temperatures, the  
5 future availability of water, and any potential operating constraints. Hydro resources  
6 have the highest value to customers when the limited amount of water is utilized during  
7 high market prices<sup>85</sup> to offset or suppress high costs. PG&E utilizes three hydro models  
8 (PLEXOS, TESS, and Xpress) for forecasting and optimizing hydropower generation.<sup>86</sup>

## 9 **2. Analysis**

10 PG&E's hydro resources were, on average, dispatched during [REDACTED] of the 500  
11 highest energy value hours, as determined by ranking the highest hourly locational  
12 marginal price values.<sup>87</sup> This is [REDACTED] than the 2020 record year when  
13 hydro resources were dispatched during [REDACTED] of the 500 highest energy value hours,<sup>88</sup> and  
14 around the same percentage as the 2019 record year when hydro resources were  
15 dispatched during [REDACTED] of the 500 highest energy value hours.<sup>89</sup> Most of PG&E's 42  
16 dispatchable hydro units were individually dispatched between [REDACTED] and [REDACTED] of the 500  
17 highest energy value hours.<sup>90</sup> These values indicate that PG&E mostly utilized the  
18 limited amount of water for its hydro resources during the highest energy value hours and  
19 obtained the highest value to customers<sup>91</sup> to offset or suppress high costs.

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<sup>85</sup> A.22-02-015, PG&E Testimony, p. 1-16.

<sup>86</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_4\_Hydro\_Resources\_Summary\_CONF.

<sup>87</sup> A.22-02-015, Chapter 1 Workpapers, 2021\_LCD\_4\_Hydro\_Top\_500\_CONF, "Table 4.3 Hydro Stat" tab.

<sup>88</sup> A.21-03-008, Chapter 1 Workpapers, 2020\_LCD\_4\_Hydro\_Top\_500\_CONF, "Table 4.3 Hydro Stat" tab

<sup>89</sup> A.20-02-009, Chapter 1 Workpapers, 2019\_LCD\_4\_Hydro\_Top\_500, "Table 4.3 Hydro Stat" tab.

<sup>90</sup> A.22-02-015, Chapter 1 Workpapers, 2020\_LCD\_4\_Hydro\_Top\_500\_CONF, "Table 4.3 Hydro Stat" tab.

<sup>91</sup> A.22-02-015, PG&E Testimony, p. 1-16.

1 For all the reasons described above, Cal Advocates determined that PG&E [REDACTED]

### 4 **3. Summary and Recommendations**

5 Overall, PG&E demonstrated that it is bidding its hydro resources for dispatch  
6 according to least-cost dispatch principles, during times when the price and value of  
7 energy is high. PG&E also demonstrated that it is bidding the hydro resources, such as  
8 those in the Helms Pumped Storage facility, for generation according to least-cost  
9 dispatch principles, when the price and value of energy is high and pumping when prices  
10 are lower.

#### 11 **E. Management of Dispatchable Renewable Resources and Energy** 12 **Storage**

##### 13 **1. Overview**

14 PG&E contracts with and owns renewable resources with economic bidding  
15 rights.<sup>22</sup> The economic bidding of these resources captures the incremental and the  
16 opportunity costs associated with contractual and operational constraints.<sup>23</sup> In addition to  
17 calculating the cost components making up the bid cost for the economic dispatch of  
18 renewable energy in the day-ahead market, PG&E evaluates market prices and  
19 opportunity costs associated with the curtailment of renewables. For example, sometimes  
20 the CAISO-reported net energy demand approaches the minimum must-offer threshold  
21 and increases the risk of overgeneration. Overgeneration can overburden distribution and  
22 transmission lines and lead to surges and outages. At these times, energy prices are often  
23 negative to provide a financial incentive for generators to “turn off” and reduce the  
24 amount of energy flowing into the grid. This scenario typically occurs midday when  
25 solar generation is at its peak. Much like hydro resources, renewables do not have  
26 explicit fuel costs, but, unlike hydro resources, renewables can be economically curtailed

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<sup>22</sup> A.22-02-015, PG&E Testimony, p. 1-24.

<sup>23</sup> A.22-02-015, PG&E Testimony, p. 1-24.

1 at times when the CAISO system is approaching overgeneration conditions and energy  
2 costs are negative.

3 By the time scheduling coordinators consider curtailing renewable resources, other  
4 thermal resources with flexible operating protocols have already been turned off, so  
5 renewables are the next type of energy resource that can be curtailed to prevent energy  
6 overgeneration. However, to ensure compliance with California's Renewable Portfolio  
7 Standard (RPS), the utilities assess the opportunity cost of not generating the Renewable  
8 Energy Credits (RECs) associated with renewable generation when determining their  
9 curtailment bids.

10 The opportunity costs associated with renewable resources are [REDACTED]  
11 [REDACTED].<sup>24</sup> It is only  
12 economical for a renewable resource to be curtailed when the negative price at the  
13 resource's LMP is lower than the cost of a REC.<sup>25</sup> Some of PG&E's renewable resources  
14 also have operational constraints such as a limit on the number of curtailment hours per  
15 year. This presents an additional opportunity cost where PG&E must reserve renewable  
16 economic curtailment during the lowest LMPs in the year without exceeding the  
17 allowable curtailment hours in order to maximize the value of renewable resources.<sup>26</sup>

18 Battery storage can provide similar cost-mitigating services (optimization model)  
19 as hydro storage<sup>27</sup> by charging during times of the day when energy is least expensive  
20 and discharging the stored energy at times when energy is most expensive. PG&E had  
21 two small utility-scale battery storage resources that were retired and removed from the  
22 CAISO markets on July 31, 2021. PG&E ended the pilot for these battery resources  
23 because the operational and maintenance costs exceeded potential benefits from

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<sup>24</sup> A.22-02-015, PG&E Testimony, p. 1-24.

<sup>25</sup> A.22-02-015, PG&E Testimony, p. 1-25.

<sup>26</sup> A.22-02-015, PG&E Testimony, p. 1-24.

<sup>27</sup> A.22-02-015, PG&E Testimony, p. 1-21.

1 continued operations.<sup>98</sup> The incremental cost of providing either energy or ancillary  
2 services from PG&E's batteries was calculated based on the cost of maintaining the  
3 battery's State of Charge at a level permitting provision of energy or ancillary services,  
4 considering the charging efficiency. Charging energy was procured from CAISO  
5 markets in the lowest cost hours.<sup>99</sup> The incremental cost of battery discharge was based  
6 on the battery's cycling efficiency and cost of charging.<sup>100</sup>

## 7 **2. Summary and Recommendation**

8 Cal Advocates analyzed PG&E's renewable and energy storage dispatch data for  
9 the 2021 Record Period to evaluate whether PG&E economically curtailed its renewable  
10 resources responsibly and optimized its battery storage but did not identify any issues.  
11 However, as stated in Cal Advocates' previous testimonies in ERRRA Compliance  
12 proceedings, we continue to note the absence of energy storage reporting guidelines,  
13 which prevents full assessment of a utility's renewable and storage resource management.

## 14 **F. Management of Demand Response Programs**

### 15 **1. Overview**

16 PG&E manages several types of demand response (DR) programs, but the least-  
17 cost dispatch chapter, and therefore Cal Advocates' analysis, focuses on demand  
18 response resources with economic triggers. Of the different types of demand response  
19 programs with economic triggers, PG&E manages the Capacity Bidding Program (CBP)  
20 and the SmartAC Program.<sup>101</sup> Both of these DR programs are "represented as Proxy  
21 Demand Response (PDR) resources in PG&E's portfolio and bid into the day-ahead  
22 markets based on calculated availabilities and dispatch trigger prices."<sup>102</sup>

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<sup>98</sup> A.22-02-015, PG&E Testimony, p. 1-22.

<sup>99</sup> A.22-02-015, PG&E Testimony, p. 1-22.

<sup>100</sup> A.22-02-015, PG&E Testimony, p. 1-22.

<sup>101</sup> A.22-02-015, PG&E Testimony, p. 1-33.

<sup>102</sup> A.22-02-015, PG&E Testimony, p. 1-33.

## 2. Capacity Bidding Program (CBP)

The CBP is a “voluntary DR program that offers customers capacity and energy payments for being on standby to reduce load and for reducing energy consumption when requested by PG&E.”<sup>103</sup> Program participants enroll through a third-party aggregator who receives the capacity payments and awards the payments to subscribing customers.<sup>104</sup> The CBP is available from May to October of each year.<sup>105</sup> There are three CBP program options. The first is the Prescribed option, which most closely resembles the CBP programs of past years. The Prescribed CBP option is available between 1:00 PM and 9:00 PM, Monday through Friday, with a maximum dispatch of six events and 30 hours per month.<sup>106</sup> A CBP event is triggered when:

- a) The CAISO day-ahead price exceeds \$95/MWh;
- b) PG&E receives a market award or dispatch instruction from the CAISO for a PDR sourced from CBP;
- c) When PG&E, in its sole opinion, forecasts that generation resources or electric system capacity may not be adequate; or
- d) Forecasted temperature for a Sub-LAP exceeds the temperature threshold for the Sub-LAP.<sup>107</sup>

The CBP Elect option is available between 1:00 PM and 9:00 PM, Monday through Friday, with a maximum of six events and 30 hours per month, though Elect participants can choose to participate in additional events or hours.<sup>108</sup> The CBP Elect Plus option allows participation in the CAISO market for “additional hours outside the standard program hours.”<sup>109</sup> Unlike the Prescribed CBP, the tariff price trigger for CBP

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<sup>103</sup> A.22-02-015, PG&E Testimony, p. 1-35.

<sup>104</sup> PG&E Electric Bidding Schedule E-CBP, July 23, 2018. Accessed at [http://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC\\_SCHEDULES\\_E-CBP.pdf](http://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDULES_E-CBP.pdf).

<sup>105</sup> A.22-02-015, PG&E Testimony, p. 1-35.

<sup>106</sup> A.22-02-015, PG&E Testimony, p. 1-35.

<sup>107</sup> A.22-02-015, PG&E Testimony, p. 1-35.

<sup>108</sup> A.22-02-015, PG&E Testimony, p. 1-36.

<sup>109</sup> A.22-02-015, PG&E Testimony, p. 1-36.

1 Elect and Elect Plus is bid at the price chosen by the aggregator.<sup>110</sup> Starting in 2021, both  
2 the Elect and Elect Plus options allow optional weekend participation. Weekend events  
3 count toward the maximum number of consecutive event days, maximum number events  
4 per month, and maximum event hours per operating month for resources nominated for  
5 weekend participation.<sup>111</sup>

6 There are opportunity costs associated with demand response dispatch. In addition  
7 to the opportunity cost of dispatching a resource at a future time, PG&E considers  
8 customer fatigue, or when a demand response customer experiences frequent dispatch  
9 and, as a result, does not believe that the value of the dispatch outweighs the burden  
10 placed on their own operations and may be less likely to participate in the demand  
11 response program in the future.<sup>112</sup> To avoid customer fatigue and subsequent customer  
12 attrition, per customer feedback PG&E does not dispatch a demand response resource  
13 more than three business days in a row.<sup>113</sup>

### 14 **3. SmartAC Program**

15 The SmartAC Program was first integrated into the CAISO day-ahead market in  
16 2019.<sup>114</sup> In 2021, SmartAC continued to be integrated into the CAISO day-ahead energy  
17 as a PDR,<sup>115</sup> and it is still available to residential customers.<sup>116</sup> Under this program,  
18 PG&E “installs a load control device at a customer’s premise that can temporarily  
19 disengage the customer’s primary central Air Conditioning (A/C) unit or raise the  
20 temperature at the thermostat when the device is remotely activated.”<sup>117</sup> Like the CBP,  
21 the SmartAC Program is available from May 1 through October 31 of each year

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<sup>110</sup> A.22-02-015, PG&E Testimony, p. 1-36.

<sup>111</sup> A.22-02-015, PG&E Testimony, p. 1-36.

<sup>112</sup> A.22-02-015, PG&E Testimony, p. 1-39.

<sup>113</sup> A.22-02-015, PG&E Testimony, p. 1-39.

<sup>114</sup> A.20-02-009, PG&E Testimony, p. 1-38.

<sup>115</sup> A.22-02-015, PG&E Testimony, p. 1-43.

<sup>116</sup> A.22-02-015, PG&E Testimony, p. 1-43.

<sup>117</sup> A.22-02-015, PG&E Testimony, p. 1-42.

1 consistent with times of high A/C usage, up to a 100 hours of cycling per customer per  
2 year.<sup>118</sup>

3 SmartAC is both a reliability program used during emergencies and an economic  
4 program based on wholesale energy prices which can be dispatched.<sup>119</sup>

5 a) Upon the CAISO's order:

6 i. After the dispatch of Condition 2 Reliability Must-Run  
7 (RMR) units and prior to canvassing other entities and  
8 Balancing Authorities for available Manual Dispatch  
9 Energy/Capacity on interties;

10 ii. Based on its forecasted system conditions and operating  
11 procedures; or

12 iii. During emergency or near-emergency situations;

13 b) At the discretion of PG&E's energy operations center in response  
14 to a CAISO economic award in the wholesale market or high  
15 wholesale energy prices; or

16 c) During program testing.<sup>120</sup>

17 When used as a reliability program, [REDACTED]

18 [REDACTED]

19 [REDACTED]<sup>121</sup>

#### 20 4. Analysis

21 During the 2021 Record Period, PG&E dispatched CBP resources on 52 occasions  
22 for a total of 112 event hours. In comparison, PG&E dispatched CBP resources on 28  
23 occasions and 60 event hours in 2020, and 13 occasions and 20 event hours in 2019.<sup>122</sup>  
24 PG&E attributed the increase in dispatch frequency and duration from 2020 to 2021 to  
25 the increase in the number of resources dispatched under the Prescribed option.<sup>123</sup> This

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<sup>118</sup> A.22-02-015, PG&E Testimony, p. 1-43.

<sup>119</sup> A.22-02-015, PG&E Testimony, p. 1-42-43.

<sup>120</sup> A.22-02-015, PG&E Testimony, p. 1-43.

<sup>121</sup> A.22-02-015, PG&E Testimony, p. 1-44.

<sup>122</sup> A.22-02-015, PG&E Testimony, p. 1-37.

<sup>123</sup> A.22-02-015, PG&E Testimony, p. 1-36.

1 was due to higher 2021 market prices that more frequently reached the \$95/MWh trigger  
2 price for the Prescribed events. Prescribed resources were often dispatched for up to the  
3 6 allowable program events per month program limit.<sup>124</sup>

4 During the times that the CBP trigger conditions were met, and the resources were  
5 dispatched,<sup>125</sup> the average hourly net cost was [REDACTED]<sup>126</sup> By comparison, the  
6 average hourly potential price for the times that the CBP trigger conditions were forecast,  
7 whether they were dispatched, was [REDACTED].<sup>127</sup> The [REDACTED]<sup>128</sup> [REDACTED] between the  
8 two values can be attributed to instances where the trigger for an event was met, but  
9 resources were not ultimately dispatched due to resources having already reached their  
10 maximum number of events per month or maximum number of consecutive event days.

11 PG&E provided the data for all the instances that the economic trigger was met,  
12 but the CBP resource was not dispatched. During the 2021 Record Period, there were  
13 five occasions totaling 9 hours when CBP resources received market awards but were not  
14 dispatched.<sup>129</sup> On four occasions totaling 8 hours, CBP resources were not dispatched  
15 because those resources had already reached either the maximum number of events per  
16 month or the maximum number of consecutive event days.<sup>130</sup> The one occasion totaling  
17 1 hour, when the trigger was met but CBP resources were not dispatched, was due to  
18 technical difficulties with PG&E's notification and dispatch system.<sup>131</sup> By comparison,  
19 during the 2020 Record Period, there were nine occasions when the economic trigger was  
20 met, but the CBP resource was not dispatched.<sup>132</sup>

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<sup>124</sup> A.22-02-015, PG&E Testimony, p. 1-36.

<sup>125</sup> This is also known as an "actual" dispatch. (A.22-02-015, PG&E Testimony, p. 1-38).

<sup>126</sup> A.22-02-015, PG&E Testimony, p. 1-42.

<sup>127</sup> A.22-02-015, PG&E Testimony, p. 1-42.

<sup>128</sup> A.22-02-015, PG&E Testimony, p. 1-42.

<sup>129</sup> A.22-02-015, PG&E Testimony, p. 1-40.

<sup>130</sup> A.22-02-015, PG&E Testimony, p. 1-40.

<sup>131</sup> A.22-02-015, PG&E Testimony, p. 1-40.

<sup>132</sup> A.21-03-008, PG&E Testimony, p. 1-37.

1 In the 2021 Record Period, PG&E was authorized to dispatch the SmartAC  
2 program in targeted locations for the support of Public Safety Power Shutoffs (PSPS) as  
3 part of Resolution E-5164, Evaluation of Clean Energy Resource Opportunities for  
4 Substation Microgrids. However, the substations that were originally targeted for use  
5 during the PSPS Microgrid pilot were not called for any PSPS events during the 2021  
6 summer DR season. In the 2021 Record Period, PG&E dispatched its SmartAC  
7 resources during the summer DR season on nine occasions for a total of 25.183 hours,  
8 and all events were dispatched because of market awards or a CAISO emergency.<sup>133</sup>  
9 Eight of the dispatches were triggered by a market award, and one was for a transmission  
10 emergency.<sup>134</sup> There were no instances when SmartAC resources received a market  
11 award but resources were not dispatched.<sup>135</sup>

12 During actual SmartAC dispatch events, the average hourly net cost was  
13 [REDACTED].<sup>136</sup> By comparison, the average hourly potential price for all times that the  
14 SmartAC trigger conditions were forecasted, whether they were dispatched or not, was  
15 also [REDACTED].<sup>137</sup>

## 16 5. Summary and Recommendations

17 Higher CAISO DAM prices in 2021 also resulted in greater CBP resource dispatch  
18 frequency and duration. Average hourly potential LMP for the times that the CBP trigger  
19 conditions were forecast and for the times that SmartAC resources were forecast were  
20 close or identical in value to the average hourly LMP for CBP and SmartAC events  
21 actually dispatched. Given the relatively high LMP values for the CBP and SmartAC  
22 events actually dispatched and how close those values were to the forecasted LMP during

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<sup>133</sup> A.22-02-015, PG&E Testimony, Chapter 1, Attachment A, Summary of Triggered Dispatch from Demand Response Programs.

<sup>134</sup> A.22-02-015, PG&E Testimony, Chapter 1, Attachment A, Summary of Triggered Dispatch from Demand Response Programs.

<sup>135</sup> A.22-02-015, PG&E Testimony, p. 1-46.

<sup>136</sup> A.22-02-015, PG&E Testimony, p. 1-46.

<sup>137</sup> A.22-02-015, PG&E Testimony, p. 1-46.

times when trigger conditions were forecasted, Cal Advocates finds that PG&E managed its CBP and SmartAC resources reasonably.

## V. CONCLUSION

Overall, Cal Advocates finds that PG&E managed its thermal, hydro, and demand response resources reasonably and does not recommend any disallowances.

## LIST OF ATTACHMENTS FOR CHAPTER 2

#	Attachment	Description
1	Attachment 2.1 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008 - PG&E Chapter 1 Workpapers, 2020_LCD_2_Bid_Cost_Calculation_CONF, “CLEAN_VS_CALC” tab
2	Attachment 2.2 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008 – PG&E Chapter 1 Workpapers, 2020_LCD_2_Bid_Cost_Calculation_CONF, Table 2.1.2-Annual Comparison
3	Attachment 2.3 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_3_SelfCommitment_CONF
4	Attachment 2.4 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_6_Highest_Energy_Value_Days_and_Price_Forecast_Summary_CONF.
5	Attachment 2.5 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_6_HighestEnergyValueDays_CONF.
6	Attachment 2.6 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_Workpaper_6_HighestEnergyValueDays_CONF
7	Attachment 2.7 (CONFIDENTIAL) (Available via e-mail only)	A.20-02-009, Chapter 1 Workpapers, 2019_LCD_Workpaper_6_HighestEnergyValueDays_CONF
8	Attachment 2.8	ERRA-2021-PGE-Compliance_DR_CalAdvocates_019-Q002, July 25, 2022
9	Attachment 2.9 (CONFIDENTIAL) (Available via e-mail only)	Public Advocates Office Workpapers, 2021-LCD_Workpaper_6_HighestEnergyValueDays_CONF
10	Attachment 2.10 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_7_Load_Bid_CONF.xlsx

11	Attachment 2.11 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_Workpaper_7_Load_Bid_CONF
12	Attachment 2.12 (CONFIDENTIAL) (Available via e-mail only)	Public Advocates Office Workpapers, 2021_LCD_Workpaper_7_Load_Bid_CON
13	Attachment 2.13 (CONFIDENTIAL)	A.22-05-015, Chapter 1 Workpapers, 2021_LCD_2_Bid_Cost_Calculation_ Summary
14	Attachment 2.14 (CONFIDENTIAL) (Available via e-mail only)	A.22-05-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_2_BidCostCalculation_ CONF, Table 2.2-Annual Non-Award
15	Attachment 2.15 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_2_BidCostCalculation_ CONF, “Table 2.5 – Annual Non-Bid” tab
16	Attachment 2.16 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_3_SelfCommitment_Summary_ CONF
17	Attachment 2.17 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_4_Hydro_Resources_Summary_ CONF
18	Attachment 2.18 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_4_Hydro_Top_500_CONF, “Table 4.3 Hydro Stat” tab
19	Attachment 2.19 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_4_Hydro_Top_500_CONF, “Table 4.3 Hydro Stat” tab
20	Attachment 2.20 (Available via e-mail only)	A.20-02-009, Chapter 1 Workpapers, 2019_LCD_4_Hydro_Top_500, “Table 4.3 Hydro Stat” tab
21	Attachment 2.21 (Available via e-mail only)	2021_LCD_Workpaper_1_CommitmentCostDeci sions

## CHAPTER 3 UTILITY-OWNED GENERATION – FOSSIL AND RENEWABLES

(Witness: Michael Yeo)

### I. INTRODUCTION AND RECOMMENDATIONS

This chapter addresses Pacific Gas and Electric Company's (PG&E) management and operation of its utility-owned non-nuclear facilities (fossil-fuel, fuel cell, and photovoltaic) and the outages that occurred at these facilities during the 2021 Record Period (January 2, 2021 to December 31, 2021).

After reviewing PG&E's testimony and responses to data requests, Cal Advocates finds that PG&E prudently managed the Humboldt Bay Generating Station Unit 2 outage on February 6, 2021 and performed the appropriate corrective actions.

### II. GENERATION FACILITIES

During the 2021 Record Period, PG&E (Utility) owned, operated, and maintained three fossil-fuel generating stations, two fuel cell facilities, and ten ground-mounted photovoltaic (PV) solar stations.<sup>138</sup> In addition, in San Francisco PG&E owns three small photovoltaic facilities that entered commercial operations in 2007.<sup>139</sup> Because these facilities total less than 300 kilowatts (kW), PG&E did not address them in its Direct Testimony.<sup>140</sup>

The three fossil-fuel generating stations are Gateway Generating Station (Gateway Station), Colusa Generating Station (Colusa Station), and Humboldt Bay Generating Station (Humboldt Station).<sup>141</sup> These three generating facilities have a combined maximum normal operating capacity of 1,400 megawatts (MW).<sup>142</sup>

PG&E's small fuel cell facilities are the California State University East Bay (CSU East Bay) Fuel Cell Facility and the San Francisco State University (SFSU) Fuel

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<sup>138</sup> PG&E Testimony, p. 3-1, line 11 to 13.

<sup>139</sup> PG&E Testimony, p. 3-1, line 13, footnote 1.

<sup>140</sup> PG&E Testimony, p. 3-1, line 13, footnote 1.

<sup>141</sup> PG&E Testimony, p. 3-1, line 13-15.

<sup>142</sup> PG&E Testimony, p. 3-1, line 15-16.

1 Cell Facility.<sup>143</sup> The fuel cells were in service periodically throughout the Record  
2 Period.<sup>144</sup> These fuel cells were installed pursuant to PG&E's application to install fuel  
3 cells on state-owned property approved in D.10-04-028.<sup>145</sup> The fuel cells were retired  
4 from service on May 31, 2021.<sup>146</sup>

5 The ten ground-mounted PV generating stations are Cantua, Five Points, Gates,  
6 Giffen, Guernsey, Huron, Stroud, Vaca Dixon, West Gates and Westside Solar Station.<sup>147</sup>  
7 These facilities were built as part of the Utility-Owned Generation (UOG) portion of  
8 PG&E's five-year solar PV Program approved in D.10-04-052.<sup>148</sup>

## 9 **A. Fossil Facilities**

### 10 **1. Gateway Generating Station**

11 The Gateway Generating Station (Gateway Station) is a 530 MW combined cycle  
12 power plant consisting of two General Electric (GE) Frame 7FA combustion turbine  
13 (CT)-generators, each with its own Vogt-NEM heat recovery steam generator (HRSG),  
14 and a single GE steam turbine (ST)-generator.<sup>149</sup> In this standard 2 × 1 configuration  
15 (i.e., two CTs and one HRSG), each CT generates power and exhausts directly into its  
16 own HRSG where the exhaust heat is captured and generates steam for use in the ST.<sup>150</sup>  
17 It is located in Antioch, California.<sup>151</sup>

### 18 **2. Colusa Generating Station**

19 The Colusa Generating Station (Colusa Station) is a 530 MW combined cycle  
20 power plant consisting of two GE Frame 7FA CTs, each with its own HRSG, and a single

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<sup>143</sup> PG&E Testimony, p. 3-1, line 17-19.

<sup>144</sup> PG&E Testimony, p. 3-1, line 19-20.

<sup>145</sup> PG&E Testimony, p. 3-1, line 20-21.

<sup>146</sup> PG&E Testimony, p. 3-1, line 22.

<sup>147</sup> PG&E Testimony, p. 3-1, line 23-25.

<sup>148</sup> PG&E Testimony, p. 3-1, line 25-27.

<sup>149</sup> PG&E Testimony, p. 3-2, line 3 to 6.

<sup>150</sup> PG&E Testimony, p. 3-2, line 7 to 9.

<sup>151</sup> PG&E Testimony, p. 6-2, Table 6-1.

1 GE ST.<sup>152</sup> In this standard 2 × 1 configuration, each CT generates power and exhausts  
2 directly into its own HRSG where the exhaust heat is captured and generates steam for  
3 use in the ST.<sup>153</sup> It is located in the town of Maxwell, Colusa County, California.<sup>154</sup>

### 4                   **3.       Humboldt Bay Generating Station**

5               The Humboldt Generating Station (Humboldt Station) is a 163 MW reciprocating  
6 engine power plant consisting of ten Wärtsilä 18V50 Dual Fuel (DF), natural gas-fired  
7 reciprocating units.<sup>155</sup> The MW capacity of each engine is 16.27 MW, and each of the  
8 ten engines have the same capacity.<sup>156</sup>

9               Each unit has 18 cylinders, each with a bore of 50 centimeters, and operates at 514  
10 revolutions per minute.<sup>157</sup> Each unit is designed to run on natural gas with one percent of  
11 total fuel input provided by low sulfur distillate as the pilot fuel.<sup>158</sup> The units are also  
12 designed to run on low sulfur distillate or biodiesel.<sup>159</sup> Each unit is equipped with a  
13 separate independent closed loop cooling system.<sup>160</sup> Emission control is accomplished  
14 with Selective Catalytic Reduction (SCR).<sup>161</sup>

15               Humboldt Station is in the town of Eureka, California.<sup>162</sup>

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<sup>152</sup> PG&E Testimony, p. 3-2, line 21 to 22.

<sup>153</sup> PG&E Testimony, p. 3-2, line 23 to 25.

<sup>154</sup> PG&E Testimony, p. 6-2, Table 6-1.

<sup>155</sup> PG&E Testimony, p. 3-3, line 4 to 6.

<sup>156</sup> PG&E Response to Cal Advocates Data Request 2, Question 9.

<sup>157</sup> PG&E Testimony, p. 3-3, line 6 to 7.

<sup>158</sup> PG&E Testimony, p. 3-3, line 7 to 9.

<sup>159</sup> PG&E Testimony, p. 3-3, line 9 to 10.

<sup>160</sup> PG&E Testimony, p. 3-3, line 10 to 11.

<sup>161</sup> PG&E Testimony, p. 3-3, line 11 to 12.

<sup>162</sup> PG&E Testimony, p. 6-2, Table 6-1.

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<sup>171</sup> PG&E Testimony, p. 3-4, line 7 to 10.

1                           **c.     Solar Station Facilities**<sup>172</sup>

2           The ten photovoltaic facilities are:

3                   i.     Cantua Solar Station

4           Cantua, a 20 MW photovoltaic solar station located near Cantua Creek, California,  
5 consists of approximately 110,000 solar modules.<sup>173</sup> The station has 32 inverters;  
6 16 transformers that increase the voltage from 320 V to 12.47 kV; and an electrical  
7 switchgear.<sup>174</sup>

8                   **5.     Five Points Solar Station**

9           Five Points, a 15 MW photovoltaic solar station located near Five Points,  
10 California, consists of over 75,000 solar modules.<sup>175</sup> The station has 24 inverters;  
11 12 transformers that increase the voltage from 320 V to 12.47 kV; and an electrical  
12 switchgear.<sup>176</sup>

13                   **6.     Gates Solar Station**

14           Gates, a 20 MW photovoltaic solar station located adjacent to the Huron Solar  
15 Station near Huron, California, consists of 91,490 solar modules.<sup>177</sup> The station has  
16 28 inverters; 31 transformers that increase the voltage from 420 V to 12.47 kV; and an  
17 electrical switchgear.<sup>178</sup>

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<sup>172</sup> PG&E Testimony, p. 3-4 to 3-6.

<sup>173</sup> PG&E Testimony, p. 3-5, line 23 to 25.

<sup>174</sup> PG&E Testimony, p. 3-5, line 25 to 28.

<sup>175</sup> PG&E Testimony, p. 3-5, line 9 to 11.

<sup>176</sup> PG&E Testimony, p. 3-5, line 11 to 14.

<sup>177</sup> PG&E Testimony, p. 3-6, line 4 to 6.

<sup>178</sup> PG&E Testimony, p. 3-6, line 6 to 9.

1                   **7.     Giffen Solar Station**

2                   Giffen, a 10 MW photovoltaic solar station located near Cantua Creek, California,  
3 consists of nearly 55,000 solar modules.<sup>179</sup> The station has 16 inverters; 8 transformers  
4 that increase the voltage from 320 V to 12.47 kV; and an electrical switchgear.<sup>180</sup>

5                   **8.     Guernsey Solar Station**

6                   Guernsey, a 20 MW photovoltaic solar station located near Hanford, California,  
7 consists of 89,400 solar modules.<sup>181</sup> The station has 40 inverters; 11 transformers that  
8 increase the voltage from 420 V to 12.47 kV; and an electrical switchgear.<sup>182</sup>

9                   **9.     Huron Solar Station**

10                  Huron, a 20 MW photovoltaic solar station located near Huron, California,  
11 consists of over 90,000 solar modules.<sup>183</sup> The station has 40 inverters; 10 transformers  
12 that increase the voltage from 420 V to 12.47 kV; and an electrical switchgear.<sup>184</sup>

13                  **10.    Stroud Solar Station**

14                  Stroud, a 20 MW photovoltaic solar station located near Helm, California, consists  
15 of 88,000 solar modules.<sup>185</sup> The station has 40 inverters; 20 transformers that increase  
16 the voltage from 440 V to 12.47 kV; and an electrical switchgear.<sup>186</sup>

17                  **11.    Vaca Dixon Solar Station**

18                  Vaca Dixon, a 2 MW photovoltaic solar station located in Vacaville, California,  
19 consists of 9,672 solar modules.<sup>187</sup> The station has five inverters that convert the direct  
20 current (DC) energy to alternating current (AC); one transformer that increases the

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<sup>179</sup> PG&E Testimony, p. 3-5, line 30 to 32.

<sup>180</sup> PG&E Testimony, p. 3-5, line 32 to p. 3-6, line 2.

<sup>181</sup> PG&E Testimony, p. 3-6, line 18 to 20.

<sup>182</sup> PG&E Testimony, p. 3-6, line 20 to 23.

<sup>183</sup> PG&E Testimony, p. 3-5, line 16 to 17.

<sup>184</sup> PG&E Testimony, p. 3-5, line 18 to 21.

<sup>185</sup> PG&E Testimony, p. 3-5, line 2 to 3.

<sup>186</sup> PG&E Testimony, p. 3-5, line 4 to 7.

<sup>187</sup> PG&E Testimony, p. 3-4, line 20 to 21.

1 voltage from 480 V to 12.47 kilovolt (kV); and other equipment, including a  
2 communications enclosure, two weather stations, and an electrical switchgear.<sup>188</sup>

### 3 **12. Westside Solar Station**

4 Westside, a 15 MW photovoltaic solar station located near Five Points, California,  
5 consists of over 66,000 solar modules.<sup>189</sup> The station equipment includes 30 inverters,  
6 15 transformers that increase the voltage from 440 volt (V) to 12.47 kV and an electrical  
7 switchgear.<sup>190</sup>

### 8 **13. West Gates Solar Station**

9 West Gates, a 10 MW photovoltaic solar station located near Huron, California,  
10 consists of over 45,752 solar modules.<sup>191</sup> The station has 14 inverters; 14 transformers  
11 that increase the voltage from 420 V to 12.47 kV; and an electrical switchgear.<sup>192</sup>

## 12 **III. OUTAGES**

### 13 **A. Fuel Cell and Solar Facilities**

14 In its testimony, PG&E did not present any reportable forced outages at fuel cell  
15 or solar facilities.<sup>193</sup>

### 16 **B. Fossil Facilities**

17 For this year's review, Cal Advocates conducted further analysis and review of  
18 one specific forced outage at Humboldt Station.

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<sup>188</sup> PG&E Testimony, p. 3-4, line 22 to 26.

<sup>189</sup> PG&E Testimony, p. 3-4, line 28 to 30.

<sup>190</sup> PG&E Testimony, p. 3-4, line 30 to 33.

<sup>191</sup> PG&E Testimony, p. 3-6, line 11 to 12.

<sup>192</sup> PG&E Testimony, p. 3-6, line 13 to 16.

<sup>193</sup> PG&E Testimony, p. 3-18 to 3-23.

1           **Humboldt Station Unit 2 Outage – February 6, 2021 at 14:20**  
2           **to February 13, 2021 at 18:10 (7.16 days)<sup>194</sup>**

3           On February 6, 2021, at 2:20 p.m., Unit 2 was forced out of service during startup  
4           due to the emission control system failing to operate as required.<sup>195</sup> Upon investigation,  
5           it was determined that the programable logic controller (PLC) had failed.<sup>196</sup> Two spare  
6           PLCs were available, but they required reprogramming before the PLC could be  
7           replaced.<sup>197</sup> The PLCs were sent to the emission control system Original Equipment  
8           Manufacturer (OEM) technician for reprogramming.<sup>198</sup> The PLCs were reprogramed and  
9           sent back to Humboldt Station.<sup>199</sup> The reprogrammed PLC was installed and the unit was  
10          returned to service on February 13, 2021, at 6:10 p.m.<sup>200</sup>

11           **Humboldt Station Characteristics and Operation**

12          Humboldt provides base load and ancillary services.<sup>201</sup> During high customer  
13          natural gas demand or during unavailability of the gas transmission line feeding the  
14          Humboldt area, Humboldt Station natural gas use is curtailed, requiring the facility to  
15          transfer to distillate fuel to generate electricity and support local reliability.<sup>202</sup> Likewise,  
16          during high customer electrical demand or unavailability of electric transmission import  
17          capability feeding the Humboldt area, the highly flexible Humboldt Bay is available to  
18          support the Humboldt area electrical needs (electrical demand and voltage support).<sup>203</sup>

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<sup>194</sup> PG&E Testimony, p. 3-21, Table 3-3, page 3-22 line 2 to 11; and PG&E response to Cal Advocates Data Request 12, Question 1.

<sup>195</sup> PG&E Testimony, p. 3-22, line 2 to 4.

<sup>196</sup> PG&E Testimony, p. 3-22, line 4 to 5.

<sup>197</sup> PG&E Testimony, p. 3-22, line 5 to 7.

<sup>198</sup> PG&E Testimony, p. 3-22, line 7 to 8.

<sup>199</sup> PG&E Testimony, p. 3-22, line 9.

<sup>200</sup> PG&E Testimony, p. 3-22, line 9 to 11.

<sup>201</sup> PG&E response to Cal Advocates Data Request 2, Question 3.

<sup>202</sup> PG&E response to Cal Advocates Data Request 2, Question 3.

<sup>203</sup> PG&E response to Cal Advocates Data Request 2, Question 3.

1 The Commission, in Ordering Paragraph #2 of D.06-11-048<sup>204</sup>, granted PG&E's  
2 request for a Certificate of Public Convenience and Necessity for the Humboldt Bay  
3 Generating Station.

4 A reciprocating engine works differently than a gas turbine used in a combined-  
5 cycle generating unit. Reciprocating engines convert pressure into rotating motion using  
6 pistons, while a gas turbine engine uses the pressure from the exploding fuel to turn a  
7 turbine.<sup>205</sup> Also, reciprocating engines use the expansion of gases to drive a piston within  
8 a cylinder and convert the piston's linear movement to the circular (or rotating)  
9 movement of a crankshaft to turn a generator to generate power.<sup>206</sup>

10 The dual-fuel type reciprocating engines, vis-à-vis a gas turbine, were selected for  
11 the following reasons:<sup>207</sup>

- 12 i. Due to lack of redundancy in the natural gas supply and the  
13 risk of natural gas curtailment during cold weather in the area,  
14 the reciprocating engines can operate solely on low sulfur  
15 distillate fuel during emergencies.
- 16 ii. The heat rate curve for the dual-fuel type reciprocating engine  
17 is relatively flat over the entire load range (0-163 MW). The  
18 heat rate for combustion turbines varies greatly with output  
19 (higher heat rate at low output).

20 The 16.27 MW<sup>208</sup> output from each of the ten engines is independently connected  
21 (connected in parallel) to a common electrical bus which feeds the 60KV distribution or  
22 115KV transmission lines.<sup>209</sup> So, if one engine is out of service, the other engines can  
23 operate to provide power to the grid.<sup>210</sup>

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<sup>204</sup> A.06-04-012, *Application of Pacific Gas and Electric Company for Approval of Long-term Request for Offer Results and for Adoption of Cost Recovery and Ratemaking Mechanisms*.

<sup>205</sup> PG&E response to Cal Advocates Data Request 2, Question 6.

<sup>206</sup> PG&E response to Cal Advocates Data Request 2, Question 8.

<sup>207</sup> PG&E response to Cal Advocates Data Request 2, Question 7.

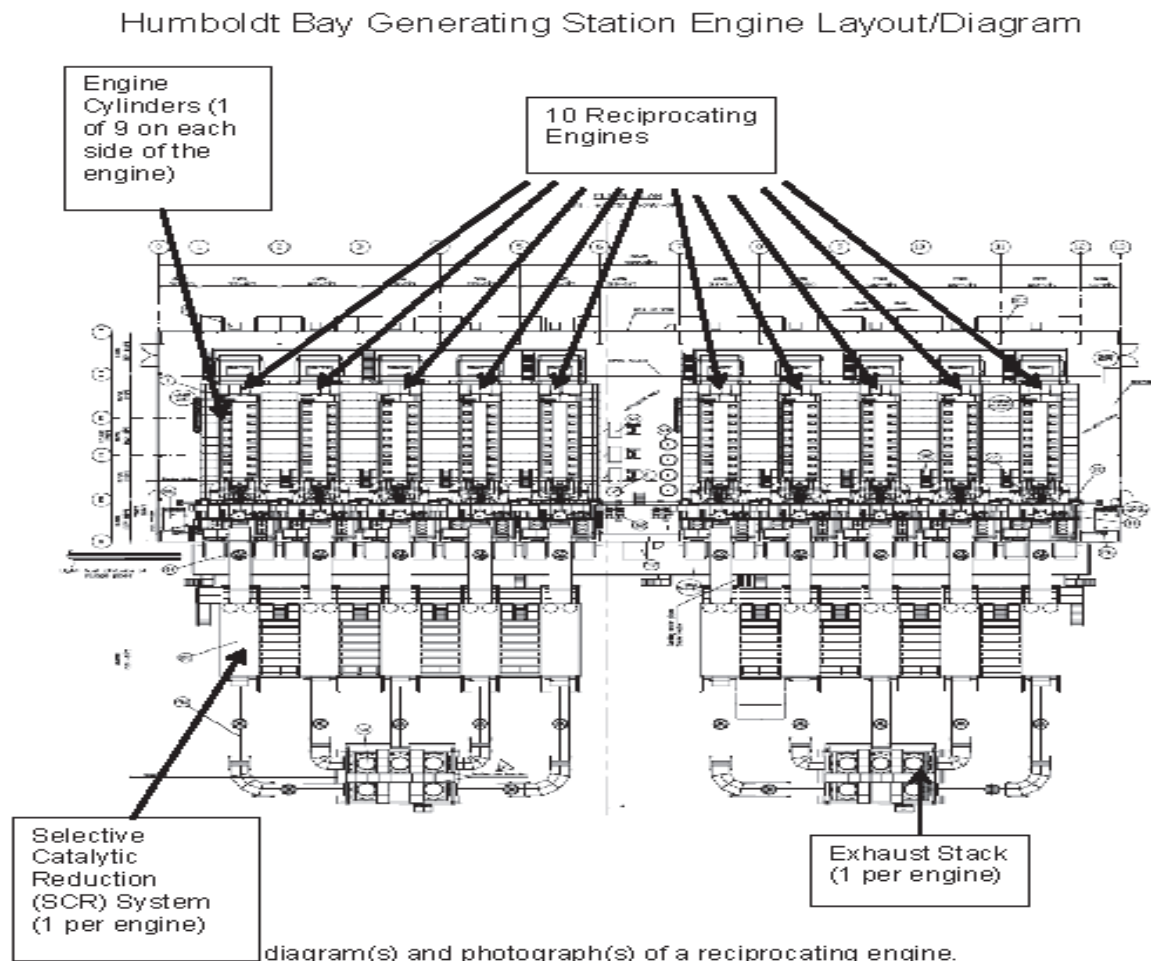
<sup>208</sup> PG&E response to Cal Advocates Data Request 2, Question 9 and 14.

<sup>209</sup> PG&E response to Cal Advocates Data Request 2, Question 10.

<sup>210</sup> PG&E response to Cal Advocates Data Request 2, Question 10.

1           Wärtsilä, the engine manufacturer, built all ten units and installed them in  
2   September 2010.<sup>211</sup> No units have been replaced since the initial installation.<sup>212</sup>  
3   Humboldt Station is the only reciprocating engine power plant in PG&E's fossil  
4   portfolio.<sup>213</sup>

5           **Figure 3-1 Humboldt Station Engine Layout – Schematic View**<sup>214</sup>



<sup>211</sup> PG&E response to Cal Advocates Data Request 2, Question 14.

<sup>212</sup> PG&E response to Cal Advocates Data Request 2, Question 15.

<sup>213</sup> PG&E response to Cal Advocates Data Request 12, Question 68.

<sup>214</sup> PG&E response to Cal Advocates Data Request 2, Question 4.

1

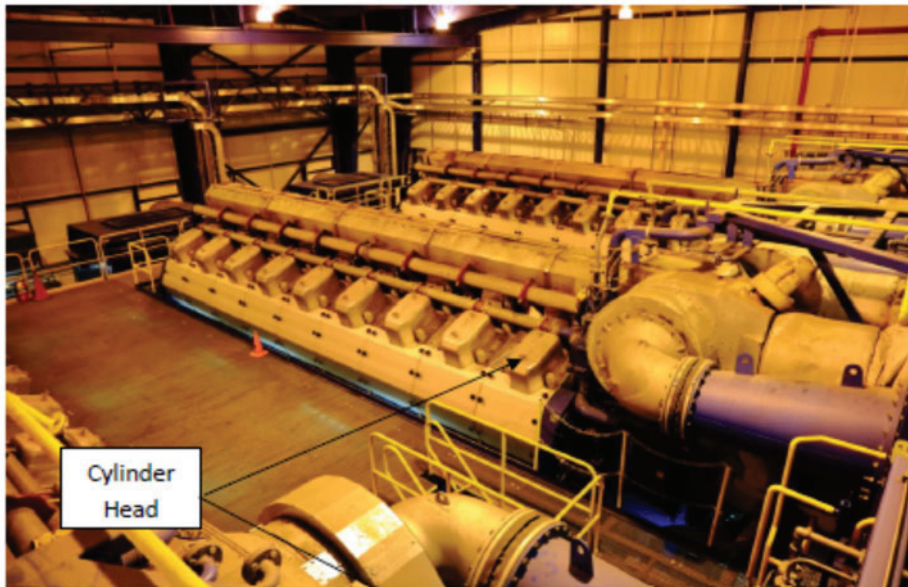
**Figure 3-2 Humboldt Station Engine Layout – External View<sup>215</sup>**



2

3

**Figure 3-3 Humboldt Station Engine Layout – Cylinder Heads<sup>216</sup>**



4

<sup>215</sup> PG&E response to Cal Advocates Data Request 2, Question 5.

<sup>216</sup> PG&E response to Cal Advocates Data Request 2, Question 13.

Each unit has 18-cylinder heads, which are labeled A1-A9 and B1-B9.<sup>217</sup>

The functions and descriptions of other activities, parts, personnel, and systems affected and/or referenced in the February 6, 2021 forced outage are as follows:

- a) Emission Control System (ECS): a structure of controls designed to keep the engines in compliance with the requirements of Title 40 Code of Federal Regulations Part 60, the Environmental Protection Agency, North Coast Air Quality Management District, and the California Energy Commission.<sup>218</sup> The environmental permit addresses many pollutants such as NO<sub>x</sub> and CO emissions.<sup>219</sup>

Emission control is accomplished with Selective Catalytic Reduction (SCR), which is a proven and advanced active emissions control technology system that injects a liquid-reductant agent through a special catalyst into the exhaust stream of the engine.<sup>220</sup> Three catalyst systems are used to reduce NO<sub>x</sub>, CO, and VOC production.<sup>221</sup> The SCR system is comprised of two layers of SCR catalyst where raw NO<sub>x</sub> is destroyed.<sup>222</sup> The exhaust gas then flows through one layer of NH<sub>3</sub> slip catalyst where the excess NH<sub>3</sub> is removed.<sup>223</sup> Immediately following the NH<sub>3</sub> slip catalyst, one row (layer) of oxidation catalyst destroys the raw CO.<sup>224</sup>

The process governing emission control is managed by a PLC located in a control panel.<sup>225</sup> Each engine has a SCR system and associated control panel.<sup>226</sup> Humboldt Station needs to comply with its Title V Permit<sup>227</sup> number NCU 059-12 (Federal

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<sup>217</sup> PG&E response to Cal Advocates Data Request 2, Question 13.

<sup>218</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>219</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>220</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>221</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>222</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>223</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>224</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>225</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

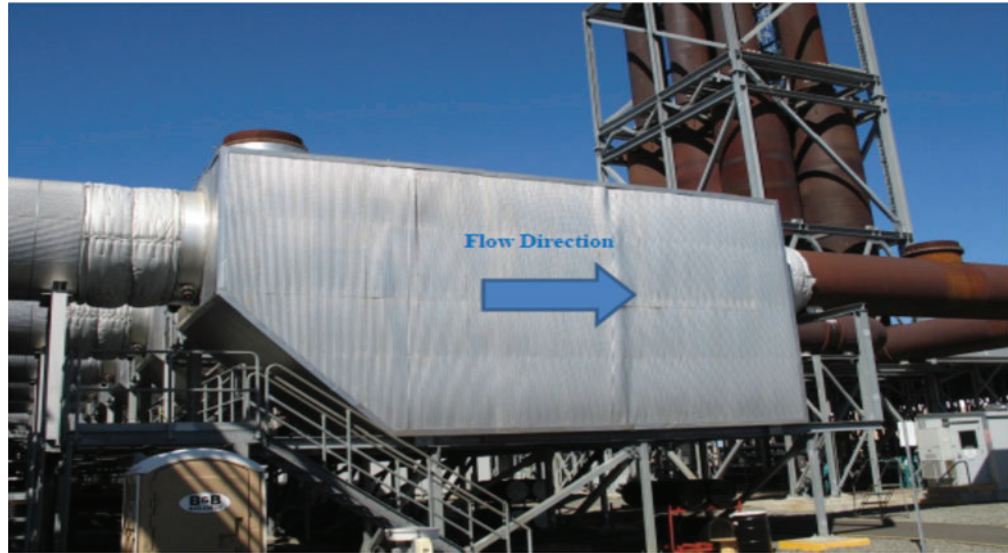
<sup>226</sup> PG&E response to Cal Advocates Data Request 2, Question 21.

<sup>227</sup> Operating Permits Issued under Title V of the US Environmental Protection Agency Clean Air Act.

1 Operating & District Permit to Operate) issued by the North  
2 Coast Unified Air Quality Management District.<sup>228</sup>

3 There is one ECS per engine, and it interacts with the engine.<sup>229</sup>  
4 Wärtsilä/HUG Engineering manufactured all ten ECS and  
5 installed them in September 2010.<sup>230</sup> No ECS have been  
6 replaced since initial installation.<sup>231</sup>

7 **Figure 3-4 Humboldt Station Emission Control Equipment – External View<sup>232</sup>**



<sup>228</sup> PG&E response to Cal Advocates Data Request 2, Question 22 and 81.

<sup>229</sup> PG&E response to Cal Advocates Data Request 2, Question 24 and 25.

<sup>230</sup> PG&E response to Cal Advocates Data Request 2, Question 26.

<sup>231</sup> PG&E response to Cal Advocates Data Request 2, Question 27.

<sup>232</sup> PG&E response to Cal Advocates Data Request 2, Question 23.

**Figure 3-5 Humboldt Station Emission Control Equipment Diagram<sup>233</sup>**



b) Programmable Logic Controller (PLC): an industrial computer control system that continuously monitors the state of input devices and makes decisions based upon a custom program to control the state of output devices.<sup>234</sup> In Humboldt Station, the PLC is the brain of the ECS, and is programmed with the appropriate logic to manage the emission controls process.<sup>235</sup>

The PLC is intrinsically a subcomponent of the ECS panel (see Figure 3.6 and 3.7).<sup>236</sup> Therefore, it needs to comply with the requirements of Title V Permit number NCU 059-12 (Federal Operating & District Permit to Operate) issued by the North Coast Unified Air Quality Management District.<sup>237</sup> There is one main ECS control PLC for each of the 10 engines.<sup>238</sup> Each PLC is programmed for the specific emission control requirements of each unit.<sup>239</sup>

<sup>233</sup> PG&E response to Cal Advocates Data Request 2, Question 23.

<sup>234</sup> PG&E response to Cal Advocates Data Request 2, Question 36.

<sup>235</sup> PG&E response to Cal Advocates Data Request 2, Question 36.

<sup>236</sup> PG&E response to Cal Advocates Data Request 2, Question 36, 38 and 39, and Data Request 12, Question 24.

<sup>237</sup> PG&E response to Cal Advocates Data Request 2, Question 22 and 38.

<sup>238</sup> PG&E response to Cal Advocates Data Request 2, Question 40.

<sup>239</sup> PG&E response to Cal Advocates Data Request 12, Question 36 and 47.

1 The PLC was manufactured by HUG Engineering, the OEM.<sup>240</sup>  
2 All ten PLCs were installed in September 2010.<sup>241</sup> No PLCs  
3 have been replaced with newly-procured PLCs; the failed PLC  
4 on Unit 2 was replaced with a PLC from inventory of the same  
5 vintage as the failed PLC.<sup>242</sup>

6 **Figure 3-6 Humboldt Station Emission Control System Panel –**  
7 **External View<sup>243</sup>**



8  
9  
10 **Figure 3-7 Humboldt Station Emission Control System Programmable Logic**  
11 **Controller – Interior View of the ECS Panel<sup>244</sup>**



<sup>240</sup> PG&E response to Cal Advocates Data Request 12, Question 24 and 86. HUG Engineering is located at 830 West 450 South, Columbus, IN 47201.

<sup>241</sup> PG&E response to Cal Advocates Data Request 2, Question 41.

<sup>242</sup> PG&E response to Cal Advocates Data Request 2, Question 42.

<sup>243</sup> PG&E response to Cal Advocates Data Request 2, Question 37.

<sup>244</sup> PG&E response to Cal Advocates Data Request 2, Question 37.

1           On February 6, 2021, CAISO called upon Unit 2 from reserve shutdown for  
2 operation.<sup>245</sup> However, the ECS failed to operate because the PLC inside the ECS  
3 failed.<sup>246</sup> The failure was due to an internal fault in the PLC.<sup>247</sup> The ECS is designed to  
4 regulate engine emissions to required levels as specified in the Title V air permit;  
5 therefore, the ECS failure meant that the unit's operation on February 6, 2021 needed to  
6 be interrupted.<sup>248</sup>

7           The PLC failure caused a loss of electronic communication.<sup>249</sup> This failure  
8 initiated an alarm for the operators to respond; the ECS is designed not to trip on  
9 alarm.<sup>250</sup> In addition, there are no Instrumentation and Controls devices or interlocking  
10 software to shut the unit down when the ECS communication alarm is lost.<sup>251</sup> Normally,  
11 the operators assess the alarm and manually make adjustments to reduce emissions levels  
12 to stay within operating limits.<sup>252</sup> If they are unable to resolve the emission issue, the  
13 engine can be shutdown using the shutdown command on the operator interface control  
14 screen.<sup>253</sup> The operators would not operate a Humboldt Station unit with a failed PLC  
15 due to their inability to control emissions of the engine via the ECS.<sup>254</sup>

16           In the February 6, 2021 outage, Unit 2 was in reserve shutdown when the alarm  
17 initiated.<sup>255</sup> The operators aborted the start-up in response to the alarm.<sup>256</sup> The forced

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<sup>245</sup> PG&E response to Cal Advocates Data Request 12, Question 10 and 11.

<sup>246</sup> PG&E response to Cal Advocates Data Request 12, Question 12 and 14.

<sup>247</sup> PG&E response to Cal Advocates Data Request 12, Question 25.

<sup>248</sup> PG&E response to Cal Advocates Data Request 12, Question 12 and 59.

<sup>249</sup> PG&E response to Cal Advocates Data Request 12, Question 12 and 14.

<sup>250</sup> PG&E response to Cal Advocates Data Request 12, Question 50 and 53.

<sup>251</sup> PG&E response to Cal Advocates Data Request 12, Question 53 and 56.

<sup>252</sup> PG&E response to Cal Advocates Data Request 12, Question 53.

<sup>253</sup> PG&E response to Cal Advocates Data Request 12, Question 53.

<sup>254</sup> PG&E response to Cal Advocates Data Request 12, Question 60.

<sup>255</sup> PG&E response to Cal Advocates Data Request 12, Question 51.

<sup>256</sup> PG&E response to Cal Advocates Data Request 12, Question 51.

1 outage was the result of an electronic hardware failure, specifically the PLC.<sup>257</sup> The PLC  
2 in an adjacent unit could not be simultaneously used for Unit 2 when Unit 2 PLC failed  
3 because each engine has its own ECS.<sup>258</sup>

4 There is no online backup system or controller because that is not consistent with  
5 industry practice for this specific application.<sup>259</sup> The ECS completed by the OEM,  
6 Wärtsilä, was designed and installed as part of Humboldt Station construction.<sup>260</sup> HUG  
7 Engineering was the OEM who designed the ECS.<sup>261</sup> Both OEMs made the  
8 determination that a backup PLC would not be required.<sup>262</sup> However, spare PLCs were  
9 provided and available to be programmed and installed.<sup>263</sup> In the last 1[1] years of 10  
10 units operating, only one PLC has failed, and that was in February 6, 2021.<sup>264</sup> According  
11 to PG&E, there is no evidence to show that PLC failures are common and would warrant  
12 a back-up control system or PLC.<sup>265</sup>

13 Prior to the outage, PG&E had two spare PLCs.<sup>266</sup> The two spare PLCs were not  
14 programmed in advance of the forced outage because PG&E does not have the capability  
15 to program the PLCs.<sup>267</sup> PG&E's vendor, HUG Engineering, programs the PLCs once it  
16 is determined on which unit the PLC will be installed.<sup>268</sup> Each ECS PLC is specifically

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<sup>257</sup> PG&E response to Cal Advocates Data Request 12, Question 26.

<sup>258</sup> PG&E response to Cal Advocates Data Request 2, Question 40 and Data Request 12, Question 61.

<sup>259</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>260</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>261</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>262</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>263</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>264</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>265</sup> PG&E response to Cal Advocates Data Request 12, Question 62.

<sup>266</sup> PG&E Testimony, p. 3.22, line 5 to 6, and PG&E response to Cal Advocates Data Request 12, Question 35.

<sup>267</sup> PG&E response to Cal Advocates Data Request 12, Question 35 and 37.

<sup>268</sup> PG&E response to Cal Advocates Data Request 12, Question 35.

1 programmed for a given unit<sup>269</sup>; so, a spare PLC had to be programmed to replace the  
2 failed Unit 2 PLC.<sup>270</sup>

3 PG&E does not have an alert system to warn them of any pending PLC failure.  
4 The PLC is an internal component of the ECS, and neither PG&E nor the OEMs,  
5 Wärtsilä and HUG Engineering, inspect or test the PLC itself.<sup>271</sup> As such, there are also  
6 no desktop procedures or in-house procedures on PLC testing.<sup>272</sup> In addition, the  
7 software program for the ECS does not require updates.<sup>273</sup> Because the PLC failure was  
8 not a result of programming issues,<sup>274</sup> the spare PLC was programmed using the same  
9 OEM specifications of the failed PLC.<sup>275</sup> The reprogrammed PLC was installed, and the  
10 unit was returned to service on February 13, 2021, at 18:10.<sup>276</sup>

11 No emission violations occurred as result of the February 6, 2021 PLC failure.<sup>277</sup>

12 There have been no previous problems or failures found with the ECS PLC for any  
13 of the Humboldt Station engines.<sup>278</sup> In addition, PG&E has not experienced a similar  
14 type of outage previously in its fossil portfolio.<sup>279</sup>

### 15 **Inspection and Maintenance**

16 The only part and/or component that failed in this outage was the Unit 2 ECS  
17 PLC.<sup>280</sup> An internal fault in the PLC caused it to fail.<sup>281</sup> There were no regularly-

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<sup>269</sup> PG&E response to Cal Advocates Data Request 12, Question 36 and 47.

<sup>270</sup> PG&E response to Cal Advocates Data Request 12, Question 36.

<sup>271</sup> PG&E response to Cal Advocates Data Request 12, Question 16, 17, 19 and 31.

<sup>272</sup> PG&E response to Cal Advocates Data Request 12, Question 32.

<sup>273</sup> PG&E response to Cal Advocates Data Request 12, Question 26.

<sup>274</sup> PG&E response to Cal Advocates Data Request 12, Question 36.

<sup>275</sup> PG&E response to Cal Advocates Data Request 12, Question 38 and 92.

<sup>276</sup> PG&E Testimony, p. 3-22, line 9 to 11.

<sup>277</sup> PG&E response to Cal Advocates Data Request 12, Question 82.

<sup>278</sup> PG&E response to Cal Advocates Data Request 12, Question 18 and 28.

<sup>279</sup> PG&E response to Cal Advocates Data Request 12, Question 69.

<sup>280</sup> PG&E response to Cal Advocates Data Request 12, Question 64.

<sup>281</sup> PG&E response to Cal Advocates Data Request 12, Question 25 and 65.

1 scheduled inspection and maintenance requirements for the PLC because the PLC is an  
2 internal component of the ECS, and neither PG&E nor the OEM physically inspect or test  
3 the PLC itself.<sup>282</sup> In addition, there have been no problems found with the ECS PLC for  
4 any of the Humboldt Station engines.<sup>283</sup>

5 Lastly, Humboldt Station is the only reciprocating engine power plant in PG&E's  
6 fossil portfolio.<sup>284</sup> The ECS is unique to Humboldt engine emission control  
7 requirements; therefore, inspection and maintenance activities would not be comparable  
8 to the combined cycle fossil plants in PG&E's portfolio.<sup>285</sup>

#### 9 **North American Electric Reliability Corporation (NERC) Classification and** 10 **GADS Cause Code**

11 Generation Availability Data System (GADS) is North American Electric  
12 Reliability Corporation's (NERC's) official reporting system for collecting information  
13 about the performance of electric generating equipment.<sup>286</sup> The requirement to report  
14 NERC event types and NERC cause codes is specified in the NERC GADS Data  
15 Reporting Instructions.<sup>287</sup> As of January 1, 2013, GADS reporting became mandatory  
16 for conventional generating units that are 20 MW and larger.<sup>288</sup>

17 According to PG&E, the February 6, 2021 Unit 2 forced outage event was  
18 classified as a NERC Event Type U1.<sup>289</sup> A U1 outage is an immediate unplanned or  
19 forced outage that requires immediate removal of the unit from service, another outage

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<sup>282</sup> PG&E response to Cal Advocates Data Request 12, Question 16, 17, 18, 19 and 66.

<sup>283</sup> PG&E response to Cal Advocates Data Request 12, Question 18.

<sup>284</sup> PG&E response to Cal Advocates Data Request 12, Question 68.

<sup>285</sup> PG&E response to Cal Advocates Data Request 12, Question 68.

<sup>286</sup> PG&E response to Cal Advocates Data Request 12, Question 4.

<sup>287</sup> PG&E response to Cal Advocates Data Request 12, Question 7 and 8.

<sup>288</sup> PG&E response to Cal Advocates Data Request 12, Question 7 and 8.

<sup>289</sup> PG&E response to Cal Advocates Data Request 12, Question 2.

1 state, or a reserve shutdown state.<sup>290</sup> The Humboldt Unit 2 forced outage met the NERC  
2 GADS definition of a U1 outage.<sup>291</sup>

3 PG&E classified this outage with Cause Code 5299, described as, “Other  
4 miscellaneous diesel engine problems,” even though the outage was caused by the failure  
5 of the PLC.<sup>292</sup> PG&E explained that the Cause Code 5299 best represented the cause of  
6 the outage when the operator entered the event into the system.<sup>293</sup> There are two Event  
7 Types that are reported in GADS: Inactive and Active.<sup>294</sup> The Inactive Event Type  
8 includes Inactive Reserve, Mothballed, and Retired.<sup>295</sup> The Active Event type includes  
9 U1, which is the one used in the February 6, 2021 outage.<sup>296</sup>

10 PG&E reports the NERC Event Types and GADS Cause Codes each quarter to  
11 NERC, consistent with the NERC GADS Data Reporting Instructions.<sup>297</sup> PG&E also  
12 provides this information to the CPUC and various parties in PG&E's CPUC proceedings  
13 upon request.<sup>298</sup>

#### 14 **Outage Duration**

15 The February 6, 2021 outage lasted 7 days, 3 hours and 50 minutes, or 7.16  
16 days.<sup>299</sup> PG&E provided the following major events to account for the outage time:<sup>300</sup>

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<sup>290</sup> PG&E response to Cal Advocates Data Request 12, Question 2.

<sup>291</sup> PG&E response to Cal Advocates Data Request 12, Question 2.

<sup>292</sup> PG&E response to Cal Advocates Data Request 12, Question 3.

<sup>293</sup> PG&E response to Cal Advocates Data Request 12, Question 3.

<sup>294</sup> PG&E response to Cal Advocates Data Request 12, Question 5.

<sup>295</sup> PG&E response to Cal Advocates Data Request 12, Question 5.

<sup>296</sup> PG&E response to Cal Advocates Data Request 12, Question 5.

<sup>297</sup> PG&E response to Cal Advocates Data Request 12, Question 6.

<sup>298</sup> PG&E response to Cal Advocates Data Request 12, Question 6.

<sup>299</sup> PG&E Testimony, page 3-21, Table 3-3, p. 3-22 line 2 to 11; and PG&E response to Cal Advocates Data Request 12, Question 1.

<sup>300</sup> PG&E response to Cal Advocates Data Request 12, Question 48 and 95.

**Table 3-1 Duration of February 6, 2021 Outage<sup>301</sup>**

<b>Date</b>	<b>Activity Description</b>
2/6/21 - 2/7/21	While in reserve shutdown, indication received on ECS loss of communication. Cycled communication power to reset ECS but still received alarm. Investigated the HUG engineering ECS control panel and determined PLC was not functioning.
2/7/21 - 2/8/21	Contacted HUG engineering and shipped spare PLC to HUG engineering for programming.
2/8/21 - 2/11/21	HUG engineering programmed PLC for Unit 2.
2/11/21 - 2/12/21	Shipped programmed PLC back to Humboldt.
2/12/21 - 2/13/21	PG&E installed the programmed PLC and confirmed ECS communication was reestablished, and ECS loss of communication indication cleared. Unit was placed in service for short period of time for online testing with no issues found.

Cal Advocates accepts PG&E's above explanation for the amount of outage time. Cal Advocates also notes that four to five days of time, from February 7 to February 12, were spent solely on having the spare PLC shipped and returned to have it programmed.

### **Postmortem and Corrective Actions**

After the outage, the following events ensued:

- 1) The failed PLC was disconnected and replaced with a spare PLC after the latter had been reprogrammed by the original OEM, HUG Engineering.<sup>302</sup> PG&E local plant management approved the installation of the programmed PLC.<sup>303</sup>

The two spare PLCs are original equipment from initial commissioning of the engines in 2009.<sup>304</sup> Neither Wärtsilä, the engine OEM, nor HUG engineering, the ECS control system OEM, recommended or provided additional spares.<sup>305</sup>

<sup>301</sup> PG&E response to Cal Advocates Data Request 12, Question 48 and 95.

<sup>302</sup> PG&E Testimony, p. 3-22, line 5 to 11, and PG&E response to Cal Advocates Data Request 12, Question 35, 36, 38, 40, 41, 79, 87 and 88.

<sup>303</sup> PG&E response to Cal Advocates Data Request 12, Question 90.

<sup>304</sup> PG&E response to Cal Advocates Data Request 12, Question 44.

<sup>305</sup> PG&E response to Cal Advocates Data Request 12, Question 46.

1 2) HUG Engineering programmed the PLC, and PG&E installed the  
2 PLC.<sup>306</sup>

3 3) PG&E confirmed the ECS communication was re-established  
4 and the loss of communication indication to the ECS was  
5 cleared.<sup>307</sup> PG&E started the unit in parallel with online testing,  
6 and confirmed the ECS was operating as expected.<sup>308</sup> Finally,  
7 the Utility confirmed that ammonia controls were functioning as  
8 intended with no alarms.<sup>309</sup>

9 Inspection reports were not generated for the replacement of the  
10 failed PLC.<sup>310</sup> However, the records of the programming are  
11 embedded in the PLC.<sup>311</sup> Also, the operators logged the  
12 confirmation activities.<sup>312</sup>

13 4) PG&E did not inspect the other Humboldt Station units for  
14 similar problems because it was an isolated issue and specific to  
15 an electrical component failure within the ECS panel at Unit 2.<sup>313</sup>

16 5) After this PLC failure, PG&E purchased two spare PLCs for each  
17 of the ten units; each of these spare PLCs were programmed for a  
18 specific unit.<sup>314</sup> Because no PLCs had failed prior to the  
19 February 6, 2021 outage, PG&E did not consider maintaining  
20 more spare PLCs previously.<sup>315</sup>

21 As Cal Advocates previously noted, four to five days of time<sup>316</sup>  
22 were expended to program the spare PLC. As a result, PG&E  
23 took proactive steps to not only purchase additional PLCs for  
24 each unit, but also have them pre-programmed.

25 The elimination of this four-to-five-day PLC programming  
26 duration and the additional time to buy a PLC should save

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<sup>306</sup> PG&E response to Cal Advocates Data Request 12, Question 40 and 91.

<sup>307</sup> PG&E response to Cal Advocates Data Request 12, Question 40 and 49.

<sup>308</sup> PG&E response to Cal Advocates Data Request 12, Question 49.

<sup>309</sup> PG&E response to Cal Advocates Data Request 12, Question 40.

<sup>310</sup> PG&E response to Cal Advocates Data Request 12, Question 93 and 100.

<sup>311</sup> PG&E response to Cal Advocates Data Request 12, Question 40.

<sup>312</sup> PG&E response to Cal Advocates Data Request 12, Question 93 and 100.

<sup>313</sup> PG&E response to Cal Advocates Data Request 12, Question 94 and 101.

<sup>314</sup> PG&E response to Cal Advocates Data Request 12, Question 43, 45 and 102.

<sup>315</sup> PG&E response to Cal Advocates Data Request 12, Question 44.

<sup>316</sup> PG&E response to Cal Advocates Data Request 12, Question 48.

1 ratepayers the cost of replacement power during the next unit  
2 PLC-related outage if another similar event were to occur. This  
3 cost savings could be substantial: for example, for this 7.16-day  
4 outage, the replacement power cost<sup>317</sup> was \$37,675.

5 6) The failed PLC was disposed of as E-waste.<sup>318</sup>

6 PG&E did not prepare any Root Cause Evaluation report for this February 6, 2021  
7 outage.<sup>319</sup> PG&E added that it was not required to submit any reports to any  
8 government/regulatory agencies regarding the Unit 2 forced outage.<sup>320</sup> Nor is it aware of  
9 any reports submitted by any government/regulatory agencies regarding the Unit 2 forced  
10 outage.<sup>321</sup> The Utility was not cited by any government/regulatory agencies.<sup>322</sup>

### 11 **Cost of Outage**

12 The cost of the outage consists of two components: the cost of energy purchased  
13 to replace the unavailable generation facility and the cost of the repair work at Humboldt  
14 Station Unit 2. PG&E indicated that the replacement energy cost for this outage was  
15 \$37,676.<sup>323</sup>

16 In addition, the direct PG&E cost of repairing the damage was \$2,721. PG&E  
17 adds that the direct PG&E cost of \$2,721 is addressed in PG&E's General Rate Case  
18 (GRC), i.e., the repair was performed using funding approved in the GRC.<sup>324</sup>

19 PG&E did not pursue compensation (equipment and replacement power cost) for  
20 the outage from the manufacturer or other vendors.<sup>325</sup> The warranty period for the PLCs

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<sup>317</sup> PG&E response to Cal Advocates Data Request 12, Question 71.

<sup>318</sup> PG&E response to Cal Advocates Data Request 12, Question 39 and 80.

<sup>319</sup> PG&E response to Cal Advocates Data Request 12, Question 63.

<sup>320</sup> PG&E response to Cal Advocates Data Request 12, Question 83.

<sup>321</sup> PG&E response to Cal Advocates Data Request 12, Question 84.

<sup>322</sup> PG&E response to Cal Advocates Data Request 12, Question 85.

<sup>323</sup> PG&E response to Cal Advocates Data Request 12, Question 71.

<sup>324</sup> PG&E response to Cal Advocates Data Request 12, Question 77 and 78.

<sup>325</sup> PG&E response to Cal Advocates Data Request 12, Question 74.

ended September 2011.<sup>326</sup> The total cost of the February 6, 2021 Unit 2 outage was \$40,397 (\$37,676 + \$2,721).

#### IV. CONCLUSIONS AND RECOMMENDATIONS

After reviewing PG&E's testimony and responses to data requests, Cal Advocates finds that PG&E prudently managed the Humboldt Bay Generating Station Unit 2 outage on February 6, 2021, and performed the appropriate corrective actions.

(a) The Utility promptly replaced the failed PLC and restored the Unit back in service.

(b) Beyond the restoration of the Unit, PG&E also took steps to stock, for all the ten units, spare PLCs as part of its corrective actions and preprogrammed the equipment.

This proactive action of PLC procurement and preprogramming should reduce the downtime should another PLC fail. For the February 6, 2021 outage, four to five days of time were lost to program the spare PLC. In addition, were it not for the availability of the spare PLC, additional time would have been incurred to procure one. This reduction of time to restore electric generation saves ratepayers the additional cost of replacement power.

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<sup>326</sup> PG&E response to Cal Advocates Data Request 2, Question 41 and Data Request 12, Question 73.

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### LIST OF ATTACHMENTS FOR CHAPTER 3

#	Attachment	Description
1	Attachment 3.1	PG&E Response to Cal Advocates Data Request 2, Question 1 to 42. inclusive
2	Attachment 3.2	PG&E Response to Cal Advocates Data Request 12, Question 1 to 102 inclusive.
3	Attachment 3.3 (CONFIDENTIAL) (Available via email only)	PG&E Response to Cal Advocates Data Request 12, Question 71.

3  
4

**CHAPTER 4 REVIEW ENTRIES RECORDED IN THE GREEN TARIFF  
SHARED RENEWABLES MEMORANDUM ACCOUNT AND THE GREEN  
TARIFF SHARED RENEWABLES BALANCING ACCOUNT**

(Witness: Brian Lui)

## I. INTRODUCTION AND SUMMARY

Cal Advocates reviewed Chapter 11 of PG&E's 2021 Energy Resource Recovery Account (ERRA) testimony regarding costs incurred and recorded in the Green Tariff Shared Renewables Memorandum Account (GTSRMA) and the Green Tariff Shared Renewables Balancing Account (GTSRBA) for the Record Period January 1, 2021 through December 31, 2021.

## II. RECOMMENDATIONS

Cal Advocates does not take exception to PG&E's entries in the GTSRMA or the GTSRBA for the 2021 Record Period. Cal Advocates found that the 2021 GTSRMA and GTSRBA entries are appropriate, correctly stated, and in compliance with applicable Commission Decisions. Cal Advocates does not recommend accounting adjustments and does not object to costs recorded in the GTSRMA and GTSRBA.

### III. GREEN TARIFF SHARED RENEWABLES MEMORANDUM ACCOUNT

In D.15-01-051, the Commission required that administrative and marketing costs for the Green Tariff Shared Renewable (GTSR) program be tracked in a memorandum account and be subject to reasonableness review in each investor owned utility's (IOU) annual ERRA compliance review. Costs that are found not to be reasonable cannot be collected from program participants and will be borne by shareholders. Program startup costs that are found to be reasonable can be amortized.<sup>327</sup> PG&E incurred \$744,083 in expenses in the 2021 Record Period.<sup>328</sup>

Table 4-1 shows the breakdown of costs for the Green Tariff Shared Renewables Memorandum Account by category.

<sup>327</sup> D.15-01-051, p. 113.

<sup>328</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-3 lines 9-10.

**Table 4-1<sup>329</sup>**  
**PG&E GTSRMA Recorded Costs**  
**Record Period 2021**

<b>Description</b>	<b>Amount</b>
Program Management	\$241,603
IT/ Billing System	\$236,501
Energy Procurement	\$107,327
Contact Center Operations	\$63,396
Outreach	\$95,256
<b>Total</b>	<b>\$744,083</b>

#### **IV. GREEN TARIFF RENEWABLES BALANCING ACCOUNT**

In D.15-01-051, PG&E's GTSR program design was approved with modifications. The purpose of the GTSRBA is to track revenues received and actual expenses incurred to procure renewable generation resources for customers participating in the GTSR program.<sup>330</sup> In 2021, the ending balance of the GTSRBA was a credit of \$21,215,062.

Table 4-2 shows the breakdown of expenses and revenues for the Green Tariff Shared Renewables Balancing Account.

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<sup>329</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, Table 11-1.

<sup>330</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-6 lines 15-17.

**Table 4-2<sup>331</sup>**  
**PG&E GTSRBA Expenses and Revenues**  
**Record Period 2021**

<b>Description</b>	<b>Amount</b>
Beginning Balance 1/1/2021	\$242,342
Net Revenues – FY 2021 YTD	\$(54,204,514)
Net Expenses – FY 2021 YTD	\$29,469,414
Interest – FY 2021 YTD	\$(6,717)
Disposition	\$3,284,413
<b>Ending balance 12/31/2021</b>	<b>\$(21,215,062)</b>

**V. CAL ADVOCATES ANALYSIS**

Cal Advocates reviewed PG&E’s testimony, workpapers, and PG&E’s responses to data requests. Cal Advocates also reviewed a sampling of source documents that support the expenses and revenues recorded in the GTSRMA and GTSRBA. Cal Advocates selected a sample of monthly line items to determine whether there is adequate support for those transactions. Cal Advocates’ audit sample was judgmentally selected and consisted of 12 items recorded in GTSRMA and 6 items recorded in GTSRBA. A “judgment sample” is a non-random sample selected by the auditor based on the judgment (opinion) of the auditor. When selecting a judgment sample, an auditor makes judgments about various elements, including but not limited to the internal control environment, exposure/ materiality, risk, and results of analytical reviews.

**VI. CONCLUSION**

Cal Advocates’ review of the GTSRMA and GTSRBA for the 2021 Record Period found no required accounting adjustments, and Cal Advocates does not object to the costs recorded in the GTSRMA and GTSRBA. Cal Advocates found that the 2021 GTSRMA administrative and outreach expenses are reasonable, appropriate, correctly stated, and in

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<sup>331</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-11, Table 11-4.

- 1 compliance with applicable Commission Decisions. Cal Advocates found that the 2021
- 2 GTSRBA is in compliance with the applicable tariffs and Commission directives.

## CHAPTER 5 CONTRACT ADMINISTRATION

(Witness: Patrick Cunningham)

### I. INTRODUCTION AND SUMMARY

This chapter presents Cal Advocates' review of PG&E's contract administration for Record Period 2021. PG&E reported its contract administration activity in Chapter 9 of its ERRR Compliance A.22-02-015 testimony and associated workpapers. Cal Advocates reviewed PG&E's administration of its capacity and energy resource contracts and agreements. This chapter also reviews contract disputes and any contract modifications that resulted in a notional change to the underlying value of the contract. Cal Advocates conducted its analysis to ensure that PG&E prudently administered its contracts for the benefit of ratepayers and in compliance with the Commission's Standard of Conduct #4 (SOC4).

### II. RECOMMENDATIONS

Cal Advocates makes the following recommendations:

- The Commission should disallow recovery of lost payments for the Vantage Wind Energy Center power purchase agreement (PPA) totaling [REDACTED]. PG&E failed to correctly administer this PPA by neglecting to apply a transmission cost sharing mechanism in the PPA for eight contract years.

### III. REGULATORY BACKGROUND

California Public Utilities Code Section 454.5(d)(2) established "a regulatory process to verify and ensure that each contract was administered in accordance with terms of the contract, and contract disputes that may arise are reasonably resolved." The IOUs are ordered to comply with minimum standards of conduct, including SOC4, which states that, "the utilities shall prudently administer all contracts and generation resources and dispatch the energy in a least-cost manner."<sup>332</sup> SOC4 was modified by the December decision to include specific terms regarding contract administration, specifically:

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<sup>332</sup> D.02-12-062, pp. 51-52.

1 Prudent contract administration includes administration of all  
2 contracts within the terms and conditions of those contracts... In  
3 administering contracts, the utilities have the responsibility to  
4 dispose of economic long power and to purchase economic short  
5 power in a manner that minimizes ratepayer costs... The utility bears  
6 the burden of proving compliance with the standard set forth in its  
7 plan.<sup>333</sup>

#### 8 **IV. DISCUSSION AND ANALYSIS**

9 In addition to SOC4, Cal Advocates used the following standards of review to  
10 evaluate PG&E's activities regarding its contract administration and dispute resolution  
11 practices:

- 12 i. What are the financial impacts of the disputes and outcomes?
- 13 ii. Did the utility adequately justify or explain the rationale for  
14 the disputes and outcomes, either in the application,  
15 testimony, Master Data Request, or subsequent data requests?
- 16 iii. Was the dispute resolution process initiated following a  
17 reasonable amount of communication between PG&E and the  
18 contract counterparty?
- 19 iv. Do the disputes and outcomes reflect the ratepayers' and/or  
20 stakeholders' best interests?

21 Cal Advocates reviewed PG&E's testimony, Master Data Request responses,  
22 supplemental data request responses, workpapers, past ERRA testimonies, and prior  
23 Commission decisions. Based on these communications and review of PG&E's  
24 testimony, Cal Advocates provides the following analysis.

##### 25 **A. New Contracts**

26 PG&E executed a total of 321 contracts in the Record Period.<sup>334</sup> All new contracts  
27 executed in the Record Period were approved of through other Commission processes.<sup>335</sup>

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<sup>333</sup> D.02-12-074, p. 54.

<sup>334</sup> PG&E Testimony, p. 9-14.

<sup>335</sup> Attachment 9.1 – Data Requests CONFIDENTIAL, p. 1.

1           **B.     Contract Extensions**

2           PG&E extended the contractual milestone dates for two contracts in the Record  
3 Period: North Fork Community Power (PG&E Log No. 33R433BIO) and Woodland  
4 Biomass (PG&E Log No. 33R493).

5           The North Fork Community Power (North Fork) PPA’s commercial operation date  
6 (COD) was extended from February 22, 2021 to August 22, 2021.<sup>336</sup> The extension was  
7 enabled by existing terms of the PPA and does not create any new payments by PG&E.<sup>337</sup>  
8 Following the extension, PG&E executed an amendment on June 10, 2021, which  
9 extended the COD an additional twelve months, to August 22, 2022.<sup>338</sup>

10          PG&E extended the Woodland Biomass PPA’s Expected Initial Energy Delivery  
11 Date from September 1, 2021 to October 1, 2021.<sup>339</sup> The extension was also enabled by  
12 existing contract language in the PPA and did not alter other milestone dates.

13          PG&E reported that neither extension alters the value of the contracts.<sup>340</sup> Cal  
14 Advocates finds that both extensions do not harm ratepayers and will help to facilitate  
15 successful deployment of the resources that help PG&E to meet its RPS and bioenergy  
16 procurement targets.<sup>341</sup>

17           **C.     Contract Amendments and Modifications**

18          PG&E does not seek express approval of any contract amendments for the Record  
19 Period but acknowledges that “Amendments and transactions that are routine and/or  
20 administrative in nature are approved as a part of PG&E’s contract administration.”<sup>342</sup>  
21 Cal Advocates reviewed all amendments and consents to assignments executed during

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<sup>336</sup> PG&E Testimony, p. 9-25.

<sup>337</sup> Attachment 9.1, pp. 2-3.

<sup>338</sup> PG&E Testimony, p. 9-25.

<sup>339</sup> PG&E Testimony, p. 9-25.

<sup>340</sup> Attachment 9.1, pp. 2-3.

<sup>341</sup> D.20-08-043, *Decision Revising the Bioenergy Market Adjusting Tariff Program*, August 27, 2020, p. 11.

<sup>342</sup> PG&E Testimony, p. 9-19.

1 the record period for the purpose of review of PG&E’s contract administration.<sup>343</sup> All  
2 amendments and consents to assignments were prudent and either in the interest of  
3 ratepayers or had no impact on ratepayer costs.

#### 4 **D. Contract Terminations**

5 During the Record Period, PG&E states that ten contracts expired according to  
6 contract term lengths and an additional ten contracts terminated prior to the associated  
7 contract end date.<sup>344</sup> Apart from the four terminations described below, PG&E  
8 terminated the contracts according to [REDACTED]

9 [REDACTED].<sup>345</sup> [REDACTED]  
10 [REDACTED] Cal  
11 Advocates does not object to PG&E’s ten terminations and ten expirations.

12 Cal Advocates further describes a set of four terminations that warrant a deeper  
13 explanation below.

##### 14 **1. Delta Diablo Sanitation, L.P. Reinhard, Robert and Joyce** 15 **Vieux, and Steven Spellenberg Hydro Terminations**

16 PG&E terminated these four PPAs each due to [REDACTED]. [REDACTED]  
17 [REDACTED] of the four agreements ranged from [REDACTED].<sup>346</sup> PG&E undertook a non-  
18 routine investigation of these PPAs in the Record Period, including outreach to the  
19 counterparties to determine the [REDACTED].<sup>347</sup> Three of the  
20 counterparties [REDACTED] and that the [REDACTED]  
21 [REDACTED]. Steven Spellenberg Hydro [REDACTED].<sup>348</sup>

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<sup>343</sup> Contract amendments and consents to assignment are listed in PG&E Testimony, Table 9-9, and were also reported to Cal Advocates in MDR 1.2.9. Available as: Attachment 9.2 – MDR 1.2.9  
CONFIDENTIAL.

<sup>344</sup> PG&E Testimony, Table 9-3.

<sup>345</sup> Attachment 9.1, pp. 4-5.

<sup>346</sup> Attachment 9.2 – Master Data Request response to question 1.2.9 , tab “1.2.9.4 Terminations”.

<sup>347</sup> Attachment 9.1, pp. 4-6.

<sup>348</sup> Attachment 9.1, pp. 4-5.

1 PG&E concluded that the PPAs would not provide [REDACTED]  
2 [REDACTED] and terminated the four PPAs.<sup>349</sup> PG&E [REDACTED]  
3 [REDACTED]  
4 [REDACTED].<sup>350</sup> There were no costs to terminate these PPAs.<sup>351</sup> Cal  
5 Advocates agrees with PG&E that ratepayers are indifferent to these terminations.<sup>352</sup>  
6 PG&E's contract administration may receive benefits from the [REDACTED]  
7 [REDACTED]  
8 [REDACTED].

### 9 E. Contract Disputes

10 PG&E reported three contracting disputes that were resolved during the Record  
11 Period.<sup>353</sup> Disputes with Global Ampersand LLC and mNOC AERS LLC (Micronoc)  
12 appropriately resolved contract payment and milestone issues and did not create any  
13 avoidable negative ratepayer impacts. The Micronoc dispute [REDACTED]  
14 [REDACTED]  
15 [REDACTED].<sup>354</sup> A third dispute reported by PG&E is described  
16 below.

#### 17 1. South Feather Water and Power Agency (SFWPA)

18 PG&E held a PPA with SFWPA for energy, REC, and RA capacity products for  
19 four generating powerhouses: Sly Creek, Woodleaf, Forbeston, and Kelly Ridge. The  
20 PPA totals approximately 117 MW for the four resources with an initial delivery term of  
21 [REDACTED].<sup>355</sup> Kelly Ridge, located at the base of the Oroville  
22 Dam, suffered a prolonged complete outage from February 10, 2017 through July 31,

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<sup>349</sup> Attachment 9.1, pp. 4-5.

<sup>350</sup> Attachment 9.2, tab "1.2.8, 1.2.9, 1.2.9.1 QF & IDWA".

<sup>351</sup> Attachment 9.1, pp. 4-5.

<sup>352</sup> Attachment 9.1, pp. 4-5.

<sup>353</sup> PG&E Testimony, pp. 9-15 to 9-17.

<sup>354</sup> PG&E Testimony, p. 9-17.

<sup>355</sup> Attachment 9.1, pp. 13-15, 17.

1 2018.<sup>356</sup> PG&E interpreted the PPA [REDACTED]  
2 [REDACTED].<sup>357</sup> SFWPA initiated a  
3 dispute on November 12, 2019, [REDACTED]

4 [REDACTED].<sup>358</sup>

5 The dispute was resolved [REDACTED] on September 29, 2021, through the  
6 execution of a settlement agreement.<sup>359</sup> The settlement agreement [REDACTED]

7 [REDACTED] December 18, 2021,<sup>360</sup> [REDACTED]

8 [REDACTED]

9 [REDACTED].<sup>361</sup>

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]<sup>362</sup> [REDACTED]

13 [REDACTED]

14 [REDACTED]<sup>363</sup> [REDACTED]

15 [REDACTED].

16 The settlement agreement enabled PG&E [REDACTED]

17 [REDACTED]

18 The total capacity of the four powerhouses as determined by the CAISO for 2021

19 averaged 99.3 MW.<sup>364</sup> Cal Advocates determined [REDACTED]

20 [REDACTED]<sup>365</sup> Cal Advocates

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<sup>356</sup> Attachment 9.1, pp. 13-15.

<sup>357</sup> Attachment 9.1, pp. 18-19.

<sup>358</sup> Attachment 9.1, pp. 18-19.

<sup>359</sup> Attachment 9.1, pp. 13-15.

<sup>360</sup> Attachment 9.1, pp. 13-15.

<sup>361</sup> PG&E Testimony, pp. 9-16 to 9-17.

<sup>362</sup> Attachment 9.1, pp. 13-15.

<sup>363</sup> Attachment 9.1, pp. 13-15.

<sup>364</sup> CAISO, *Final Net Qualifying Capacity Report for Compliance Year 2021*, November 12, 2021.  
Available at: <http://www.caiso.com/Documents/NetQualifyingCapacityList-2021.xlsx>

<sup>365</sup> [REDACTED]

1 concurs with PG&E that [REDACTED]  
2 [REDACTED]  
3 [REDACTED]  
4 [REDACTED] further increase the ratepayer  
5 benefits of the settlement agreement.

6 **F. Other Contracting Issues**

7 **1. Vantage Wind Energy LLC**

8 The Vantage Wind Energy Center, operated by Vantage Wind Energy LLC  
9 (Vantage), is a 90 MW wind farm located in Washington. PG&E executed a PPA with  
10 Vantage on [REDACTED] for deliveries lasting from [REDACTED] to [REDACTED]

11 [REDACTED].<sup>366</sup> The PPA includes a cost sharing mechanism for transmission-related costs.<sup>367</sup>  
12 The design of the cost sharing mechanism [REDACTED]

13 [REDACTED]  
14 [REDACTED]  
15 [REDACTED].<sup>368</sup> In 2019, PG&E discovered that the cost sharing mechanism  
16 had not been correctly applied beginning with the initial 2010-2011<sup>369</sup> period up to the  
17 2018-2019 period.<sup>370</sup> PG&E incorrectly paid the full cost of transmission costs from the  
18 contract's execution up to the 2018-2019 invoice period.

19 PG&E coordinated with Vantage to resolve the issue. PG&E was able to [REDACTED]  
20 [REDACTED] and implemented  
21 corrective actions to ensure the cost sharing mechanism is correctly applied in the

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<sup>366</sup> Attachment 9.2, tab "1.2.8, 1.2.9, 1.2.9.1 Renewable", line number 27.

<sup>367</sup> PG&E Testimony, p. 9-18.

<sup>368</sup> Cal Advocates Attachment 9.3 – Vantage PPA, Section 3.4(a)(iii) (Attachment 9.3, pp. 31-32).

<sup>369</sup> Contract payments are on an annual basis but span two calendar years since the contract began on  
[REDACTED]

<sup>370</sup> [REDACTED]  
[REDACTED] PG&E Testimony, p. 9-18 and  
Attachment 9.1, pp. 7-9.

1 future.<sup>371</sup> PG&E [REDACTED]

3 [REDACTED]<sup>372</sup> The PPA includes terms

5 [REDACTED]<sup>373</sup> In a settlement agreement executed on September 29, 2021, [REDACTED]

8 [REDACTED]<sup>374</sup> The total amount of uncollected payments of the cost  
9 sharing mechanism from contract execution to the 2018-2019 year, [REDACTED]  
10 [REDACTED], totals [REDACTED].<sup>375</sup>

11 Cal Advocates previously reviewed this issue in the 2019 Record Period ERRR  
12 Compliance proceeding, A.20-02-009. In that proceeding, PG&E explained that the cost  
13 sharing mechanism was overlooked due to “‘unique non-standard settlement provisions  
14 in the PPA,’ a lack of process documentation, passing of time, staff turnover, and  
15 ‘inadequate follow-up.’”<sup>376</sup> PG&E also noted that none of its PPAs with any other  
16 counterparties had a similar cost sharing mechanism.<sup>377</sup>

17 The reasons that PG&E cited regarding its failure to correctly administer the  
18 Vantage PPA’s cost sharing mechanism do not relieve PG&E of its responsibility for the  
19 errors over multiple years and provides evidence that it did not comply with the

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<sup>371</sup> PG&E Testimony, pp. 9-18 to 9-19.

<sup>372</sup> PG&E Testimony, p. 9-18.

<sup>373</sup> [REDACTED]  
[REDACTED] Attachment 9.3, Section 6.2 (Attachment 9.3 pp. 45-46)

<sup>374</sup> PG&E Testimony, pp. 9-18 to 9-19.

<sup>375</sup> This is the total sum of Vantage’s share (had the mechanism been correctly applied) of transmission-  
related costs since the contract’s execution up to and including the 2017-2018 contract year [REDACTED]

Attachment 9.1, pp. 7-9 and PG&E Testimony pp. 9-18 to 9-19.

<sup>376</sup> A.20-02-009, *Cal Advocates Prepared Testimony*, July 10, 2020, p. 8-5. Available as: Attachment 9.4 -  
A2002009 Cal Advocates Prepared Testimony ABRIDGED CONFIDENTIAL, p. 8-5.

<sup>377</sup> Attachment 9.4, p. 8-5.

1 requirement for prudent administration of its contract terms under SOC4. This failure led  
2 to a loss of payments from Vantage [REDACTED]  
3 [REDACTED] totaling [REDACTED] Those  
4 uncollected payments [REDACTED]  
5 [REDACTED]. Although  
6 these costs were accrued in previous record periods, consideration of past years'  
7 payments should be made in the present Application for Record Period 2021 because the  
8 settlement agreement that covered these prior years was executed, and PG&E closed the  
9 issue, during 2021.

10 Ratepayers should not be liable for the costs of PG&E's failure to properly  
11 administer the Vantage PPA. SOC4 requires PG&E to prudently administer "all  
12 contracts within the terms and conditions of those contracts."<sup>378</sup> PG&E failed to meet  
13 this Standard by failing to correctly enforce the Vantage PPA's cost sharing mechanism  
14 for transmission-related costs. The cost of this error must be borne by PG&E and its  
15 shareholders, not its ratepayers. Cal Advocates recommends the Commission disallow  
16 cost recovery equal to the uncollected payments of the cost sharing mechanism for  
17 transmission-related costs of the PPA, [REDACTED], totaling  
18 [REDACTED].

### 19 **G. Force Majeure Claims**

20 PG&E reported 32 force majeure claims. Of these, eleven claims were closed or  
21 otherwise considered resolved by PG&E within the Record Period. Cal Advocates  
22 reviewed each of the eleven closed claims. The remaining 21 unresolved claims will not  
23 be discussed in this chapter of testimony but will be reviewed in the future ERRA  
24 Compliance filing that reports the claims' resolutions.

25 Of the eleven claims resolved in the Record Period, seven were linked to [REDACTED]  
26 [REDACTED]

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<sup>378</sup> D.02-12-074, p. 54.

1 [REDACTED], causing zero impact to deliveries and ratepayer costs.<sup>379</sup> The  
2 remaining four claims are described below.

3 **1. Hummingbird Energy Storage, LLC (Hummingbird)**

4 Hummingbird initiated a force majeure claim on March 23, 2020, which was  
5 resolved during the 2021 Record Period.<sup>380</sup> Hummingbird cited [REDACTED]

6 [REDACTED]  
7 [REDACTED].<sup>381</sup> PG&E assessed the claim and additional  
8 information provided by the counterparty. PG&E [REDACTED]

9 [REDACTED]  
10 [REDACTED].<sup>382</sup> Hummingbird [REDACTED] PG&E's determination.

11 [REDACTED], which was  
12 extended from December 1, 2021, to July 1, 2023, by a separate amendment.<sup>383</sup> The

13 [REDACTED]  
14 [REDACTED] The eventual completion of Hummingbird will aid PG&E in meeting its RA  
15 requirements at a price comparable to prevailing market costs.

16 **2. North Fork Community Power (North Fork)**

17 North Fork is a Bioenergy Market Adjusting Tariff (BioMAT) resource  
18 in-development thru the Record period. North Fork submitted three force majeure claims  
19 on February 2, 2021.<sup>384</sup> The claims requested [REDACTED]

20 [REDACTED]  
21 [REDACTED].<sup>385</sup> After considering supporting information for the claims, PG&E [REDACTED]  
22 [REDACTED]

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<sup>379</sup> PG&E Testimony, Table 9-10.

<sup>380</sup> PG&E Testimony, Table 9-10.

<sup>381</sup> Attachment 9.1, p. 10.

<sup>382</sup> Attachment 9.1, p. 10.

<sup>383</sup> PG&E Testimony, Table 9-9.

<sup>384</sup> PG&E Testimony, Table 9-9.

<sup>385</sup> Attachment 9.1, pp. 11-12.

1 [REDACTED].<sup>386</sup> North Fork [REDACTED]

2 [REDACTED].<sup>387</sup>

3 PG&E's [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED] The North

8 Fork BioMAT project was separately extended from August 22, 2021 to August 2022,  
9 2022 by amendment.<sup>388</sup>

## 10 V. CONCLUSION

11 With the exception of PG&E's failure to correctly administer the Vantage PPA,  
12 Cal Advocates finds that PG&E has reasonably and prudently conducted its contract  
13 administration for the 2021 Record Period. Cal Advocates recommends the Commission  
14 adopt the recommendations concerning Vantage described above.

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<sup>386</sup> Attachment 9.1, pp. 11-12.

<sup>387</sup> Attachment 9.1, pp. 11-12.

<sup>388</sup> Attachment 9.1, pp. 11-12.

## LIST OF ATTACHMENTS FOR CHAPTER 5

#	Attachment	Description
1	5.1 <b>PARTIALLY CONFIDENTIAL</b>	Abridged collection of PG&E responses to Cal Advocates data requests cited in testimony.
2	5.2 <b>CONFIDENTIAL</b> (Available by E-mail only)	PG&E's response to Master Data Request questions 1.2.8 and 1.2.9
3	5.3 <b>CONFIDENTIAL</b>	Vantage PPA, provided by PG&E to Cal Advocates in response to data request 7, question 7.
4	5.4 <b>PARTIALLY CONFIDENTIAL</b>	A2002009 Abridged Cal Advocates' Prepared Testimony for the PG&E 2019 Record Period ERRR

## CHAPTER 6 RESOURCE ADEQUACY

(Witness: Kyle Navis)

### I. INTRODUCTION AND SUMMARY

This chapter presents Cal Advocates' review of PG&E's resource adequacy (RA) procurement and sales activities for the Record Period from January 1, 2021 through December 31, 2021. Cal Advocates' review focuses on PG&E's compliance with its Bundled Procurement Plan (BPP) in its efforts to meet RA requirements established by the Commission.

### II. RECOMMENDATIONS

Cal Advocates finds that PG&E's efforts to procure and sell RA in its solicitations were in compliance with the requirements of PG&E's BPP.

### III. BACKGROUND

The Commission provides the system, local and flexible RA requirements for each jurisdictional load-serving entity (LSE) in September of each year.<sup>389</sup> The Commission requires LSEs to make annual year-ahead compliance showings for system, local and flexible RA for the coming year by October 31<sup>st</sup> of the current year. By October 31, 2020, LSEs were required to demonstrate that they procured 100% of their local RA obligation for all 12 months of 2021 and 2022.<sup>390</sup> LSEs were also required to demonstrate that they procured at least 90% of their system RA obligation for May through September 2021, and at least 90% of their flexible RA obligation for all 12 months of 2021.

In D.21-06-029<sup>391</sup> the Commission adopted local RA capacity requirements for 2021-2023 and flexible RA capacity requirements for 2021 for Commission jurisdictional

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<sup>389</sup> PG&E Testimony, p. 8-2.

<sup>390</sup> The former 50% local RA requirement for 2023 was eliminated for LSEs by D.20-06-002 and re-assigned to the Central Procurement Entity (CPE) created by the same decision (see D.20-06-002 at p. 25 and Ordering Paragraph 7 at p. 93). The PG&E-CPE is a separate entity whose procurement activities are walled off from the procurement activities of PG&E as an LSE (See D.20-06-002, Ordering Paragraph 25, at pp. 99-100).

<sup>391</sup> D.21-06-029, pp. 7-14

1 LSEs. The Commission declined to make any changes to the system RA requirement  
2 methodology, which is based on the California Energy Commission (CEC) 1-in-2 monthly  
3 load forecast, plus a 15% planning reserve margin (PRM).<sup>392</sup>

#### 4 **IV. DISCUSSION AND ANALYSIS**

##### 5 **A. Summary of RA Requirements and PG&E's Positions**

6 PG&E reported its RA position on a quarterly basis in its Quarterly Compliance  
7 Report (QCR) filings which were timely filed throughout the Record Period and included  
8 as workpapers to the present testimony. PG&E briefed Cal Advocates and other  
9 non-market stakeholders on their RA position, sales, and purchases at Procurement  
10 Review Group (PRG) meetings. Both QCR and PRG reporting are required by PG&E's  
11 BPP.<sup>393</sup>

12 Table 6-1 shows that PG&E held [REDACTED]  
13 [REDACTED] of 2021. Additionally, PG&E was [REDACTED]  
14 [REDACTED]  
15 [REDACTED].<sup>394</sup> PG&E demonstrated its attempts to procure enough local  
16 RA to meet its requirements through a Commission waiver request.<sup>395</sup> The  
17 Commission's 2020 RA Filing Guide provided a process for LSEs to request a waiver for  
18 their local RA obligations.<sup>396</sup>

19 Decision 20-06-031 added a second component to the local RA waiver process that  
20 allowed LSEs to apply for a waiver via Tier 2 Advice Letter provided the LSE  
21 "demonstrates procurement of local RA capacity within the PG&E Other LCAs such that  
22 the LSE's collective procurement in the six disaggregated PG&E Other LCAs meets the

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<sup>392</sup> D.19-06-026, p. 12.

<sup>393</sup> PG&E BPP, Section IV, Table 4, Sheets 27-30.

<sup>394</sup> Attachment 6.1.

<sup>395</sup> PG&E Advice Letter 5989-E, *Required Demonstration for PG&E's Disaggregated PG&E Other Local Capacity Area Requirements in Compliance with Ordering Paragraph 22(a) of Decision 20-06-031*, November 2, 2020.

<sup>396</sup> 2020 Filing Guide for System, Local and Flexible Resource Adequacy (RA) Compliance Filings, July 21, 2020, p. 43.

1 LSE’s collective requirement for the disaggregated PG&E Other LCAs.”<sup>397</sup> PG&E  
2 successfully demonstrated that it had procured sufficient local RA to meet the alternative  
3 means of compliance for the aggregated PG&E Other LCAs RA requirements.<sup>398</sup> The  
4 Commission’s Energy Division (ED) ultimately approved PG&E’s local RA procurement  
5 in the PG&E Other LCA.<sup>399</sup> ED also waived penalties associated with PG&E’s individual  
6 LCA deficiencies on the grounds that PG&E pursued all commercially reasonable efforts  
7 and met its local RA obligation in the aggregated PG&E Other LCAs.

8 **Table 6-1: PG&E’s 2021 Final System and Local RA Positions (MW)**<sup>400</sup>

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
System												
Greater Bay Area												
Humboldt												
North Coast/North Bay												
Sierra												
Stockton												
Greater Fresno												
Kern												
Aggregated PG&E-Other Areas												

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<sup>397</sup> D.20-06-031, Ordering Paragraph 22, p. 97.

<sup>398</sup> PG&E Advice Letter 5989-E, *Required Demonstration for PG&E’s Disaggregated PG&E Other Local Capacity Area Requirements in Compliance with Ordering Paragraph 22(a) of Decision 20-06-031*, November 2, 2020.

<sup>399</sup> Energy Division, Non-Standard Disposition Letter, December 18, 2020.

<sup>400</sup> Data in the “System” row comes from Attachment 6.2. Data in all other rows comes from Attachment 6.1.

1 PG&E attempted to procure RA for each of the six LCAs in the PG&E Other  
2 LCA, while maintaining surplus positions in some of those areas in order to meet the  
3 aggregated PG&E Other RA requirements, although the aggregated showing was reduced  
4 by deficiencies in some LCAs.<sup>401</sup> Although surplus RA positions should be minimized in  
5 order to obtain ratepayer value through RA sales, Cal Advocates finds PG&E's surplus  
6 RA positions in the PG&E Other LCAs to be reasonable and necessary to meet the  
7 PG&E Other requirement, given PG&E's failure to procure sufficient local RA in the  
8 constituent LCAs.

9 **B. Compliance with BPP Appendix S**

10 **1. PG&E's RA Sales framework**

11 PG&E engaged in various solicitations to purchase RA, as well as monetize  
12 surplus RA positions. PG&E's BPP provides for Commission-authorized strategies and  
13 approval structures for RA transactions, including the use of competitive solicitations and  
14 bilateral and brokered transactions.<sup>402</sup> PG&E reported its RA sales and purchases in its  
15 four Record Period QCR filings which Cal Advocates reviewed upon issuance. Cal  
16 Advocates did not protest any of PG&E's 2021 QCRs.

17 PG&E's BPP requires it to make [REDACTED] available for sale.<sup>403</sup> The  
18 amount available for sale is limited by [REDACTED]

19 [REDACTED]

20 [REDACTED]

21 [REDACTED]<sup>404</sup> PG&E held five solicitations to sell  
22 excess RA capacity, including three quarterly Balance of Year Solicitations (in January  
23 2021 for Q2, April 2021 for Q3, and July 2021 for Q4).<sup>405</sup> Additionally, PG&E held a

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<sup>401</sup> PG&E Advice Letter 5989-E, *Required Demonstration for PG&E's Disaggregated PG&E Other Local Capacity Area Requirements in Compliance with Ordering Paragraph 22(a) of Decision 20-06-031*, November 2, 2020.

<sup>402</sup> PG&E BPP, Appendix B, Table B-1, Sheets 56-57.

<sup>403</sup> PG&E BPP Appendix S, Section B.3, Sheets 266.

<sup>404</sup> PG&E BPP Appendix S, Sheets 261-268.

<sup>405</sup> PG&E Testimony, p. 8-7.

1 multi-year RA sale in Q3 of 2021, and Balance of Year 2022 solicitation in November  
2 2021.<sup>406</sup> Appendix S of PG&E's BPP provides the standards and criteria for PG&E's  
3 management and sales of RA products. Appendix S requires PG&E to use a forecasted  
4 supply price curve to set floor prices for sales of RA when evaluating bids in the  
5 solicitations during the record period.<sup>407</sup>

6 Cal Advocates recommends that the Commission find that PG&E's efforts to  
7 procure and sell RA in its solicitations for Record Period 2021 were in compliance with  
8 the requirements of PG&E's BPP.

## 9 **V. CONCLUSION**

10 Cal Advocates finds that PG&E's efforts to procure and sell RA in its solicitations  
11 were in compliance with the requirements of PG&E's BPP.

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<sup>406</sup> PG&E Testimony, p. 8-7. Notably, the Balance of Year 2022 solicitation did not include January due to its timing and the inability to negotiate contracts for January 2021 within a timely manner.

<sup>407</sup> PG&E Testimony, p. 8-11.

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**LIST OF ATTACHMENTS FOR CHAPTER 6**

#	Attachment	Description
1	6.1 <b>CONFIDENTIAL</b> (Available via email)	PG&E Response to Cal Advocates Data Request 18, Question 1.
2	6.2 02_RA Portfolio Breakdown Q4 2021 <b>CONFIDENTIAL</b>	PG&E Summary of end-of-record period RA positions, from PG&E AL 6484-E, <i>Procurement Transaction Quarterly Compliance Submittal (Q4, 2021)</i> , Attachment E, January 31, 2022.

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**CHAPTER 7 REVIEW ENTRIES RECORDED IN THE GREEN TARIFF  
SHARED RENEWABLES MEMORANDUM ACCOUNT AND THE GREEN  
TARIFF SHARED RENEWABLES BALANCING ACCOUNT**

(Witness: Brian Lui)

## I. INTRODUCTION AND SUMMARY

Cal Advocates reviewed Chapter 11 of PG&E's 2021 Energy Resource Recovery Account (ERRA) testimony regarding costs incurred and recorded in the Green Tariff Shared Renewables Memorandum Account (GTSRMA) and the Green Tariff Shared Renewables Balancing Account (GTSRBA) for the Record Period January 1, 2021 through December 31, 2021.

## II. RECOMMENDATIONS

Cal Advocates does not take exception to PG&E's entries in the GTSRMA or the GTSRBA for the 2021 Record Period. Cal Advocates found that the 2021 GTSRMA and GTSRBA entries are appropriate, correctly stated, and in compliance with applicable Commission Decisions. Cal Advocates does not recommend accounting adjustments and does not object to costs recorded in the GTSRMA and GTSRBA.

### III. GREEN TARIFF SHARED RENEWABLES MEMORANDUM ACCOUNT

In D.15-01-051, the Commission required that administrative and marketing costs for the Green Tariff Shared Renewable (GTSR) program be tracked in a memorandum account and be subject to reasonableness review in each investor owned utility's (IOU) annual ERRA compliance review. Costs that are found not to be reasonable cannot be collected from program participants and will be borne by shareholders. Program startup costs that are found to be reasonable can be amortized.<sup>408</sup> PG&E incurred \$744,083 in expenses in the 2021 Record Period.<sup>409</sup>

<sup>408</sup> D.15-01-051, p. 113.

<sup>409</sup>A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-3 lines 9-10.

Table 7-1 shows the breakdown of costs for the Green Tariff Shared Renewables Memorandum Account by category.

**Table 7-1<sup>410</sup>**  
**PG&E GTSRMA Recorded Costs**  
**Record Period 2021**

Description	Amount
Program Management	\$241,603
IT/ Billing System	\$236,501
Energy Procurement	\$107,327
Contact Center Operations	\$63,396
Outreach	\$95,256
<b>Total</b>	<b>\$744,083</b>

#### **IV. GREEN TARIFF RENEWABLES BALANCING ACCOUNT**

In D.15-01-051, PG&E's GTSR program design was approved with modifications. The purpose of the GTSRBA is to track revenues received and actual expenses incurred to procure renewable generation resources for customers participating in the GTSR program.<sup>411</sup> In 2021, the ending balance of the GTSRBA was a credit of \$21,215,062.

Table 7-2 shows the breakdown of expenses and revenues for the Green Tariff Shared Renewables Balancing Account.

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<sup>410</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, Table 11-1.

<sup>411</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-6 lines 15-17.

**Table 7-2<sup>412</sup>**  
**PG&E GTSRBA Expenses and Revenues**  
**Record Period 2021**

<b>Description</b>	<b>Amount</b>
Beginning Balance 1/1/2021	\$242,342
Net Revenues – FY 2021 YTD	\$(54,204,514)
Net Expenses – FY 2021 YTD	\$29,469,414
Interest – FY 2021 YTD	\$(6,717)
Disposition	\$3,284,413
<b>Ending balance 12/31/2021</b>	<b>\$(21,215,062)</b>

**V. CAL ADVOCATES ANALYSIS**

Cal Advocates reviewed PG&E’s testimony, workpapers, and PG&E’s responses to data requests. Cal Advocates also reviewed a sampling of source documents that support the expenses and revenues recorded in the GTSRMA and GTSRBA. Cal Advocates selected a sample of monthly line items to determine whether there is adequate support for those transactions. Cal Advocates’ audit sample was judgmentally selected and consisted of 12 items recorded in GTSRMA and 6 items recorded in GTSRBA. A “judgment sample” is a non-random sample selected by the auditor based on the judgment (opinion) of the auditor. When selecting a judgment sample, an auditor makes judgments about various elements, including but not limited to the internal control environment, exposure/ materiality, risk, and results of analytical reviews.

**VI. CONCLUSION**

Cal Advocates’ review of the GTSRMA and GTSRBA for the 2021 Record Period found no required accounting adjustments, and Cal Advocates does not object to the costs recorded in the GTSRMA and GTSRBA. Cal Advocates found that the 2021 GTSRMA administrative and outreach expenses are reasonable, appropriate, correctly stated, and in

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<sup>412</sup> A.22-03-015 PG&E Direct Confidential Testimony, Chapter 11, p. 11-11, Table 11-4.

- 1 compliance with applicable Commission Decisions. Cal Advocates found that the 2021
- 2 GTSRBA is in compliance with the applicable tariffs and Commission directives.

## CHAPTER 8 SUMMARY OF PORTFOLIO ALLOCATION BALANCING ACCOUNT ENTRIES FOR THE RECORD PERIOD

(Witness: Brian Lui)

## I. INTRODUCTION AND SUMMARY

This testimony addresses Chapter 12 of PG&E’s 2021 Energy Resource Recovery Account (ERRA) compliance application, which covers the Portfolio Allocation Balancing Account (PABA) for the Record Period of January 1, 2021 through December 31, 2021. PG&E’s Portfolio Allocation Balancing Account (PABA) activity for the Record Period resulted in an over-collection amount of \$99.51 million.

## II. RECOMMENDATIONS

Cal Advocates finds that the 2021 accounting entries recorded into PABA are appropriate, correctly stated, and in compliance with applicable Commission Decisions. Cal Advocates does not recommend accounting adjustments and does not object to the costs recorded in the PABA.

### III. BACKGROUND

D.18-10-019, issued in the Power Charge Indifference Adjustment (PCIA) Rulemaking 17-06-026, significantly modified the accounting for the PCIA by requiring that PCIA revenues from customers and costs be trued-up on an annual basis.<sup>413</sup> Pursuant to D.18-10-019 Ordering Paragraph 7, the investor owned utilities were required to establish the PABA, a two-way cost balancing account with subaccounts for each vintaged portfolio including categories for billed revenues, generation resource costs, net California Independent System Operator (CAISO) market revenues associated with energy and ancillary services, and revenues associated with the renewable energy Adder and the Resource Adequacy capacity. Pursuant to D.18-10-019 Ordering Paragraph 8, each utility was required to modify its ERRA balancing account and any

<sup>413</sup> D.18-10-019, p.161, Ordering Paragraph 6.

1 other balancing accounts, as necessary, to be consistent with the PABA vintaged  
2 subaccount structure adopted in D.18-10-019.

3 PG&E submitted Advice Letter 5440-E to implement the changes in  
4 D.18-10-019.<sup>414</sup> The Commission approved PG&E Advice Letter 5440-E on May 3,  
5 2019 with an effective date of January 1, 2019. PG&E Advice Letter 5440-E  
6 established the PABA, and updated the ERRA balancing account, Modified Transition  
7 Cost Balancing Account (MTCBA) and Utility Owned Balancing Account (UGBA) to  
8 be consistent with the PABA.

9 The purpose of the PABA is to record the above-market costs for all generation  
10 resources eligible for recovery through PCIA rates.<sup>415</sup> The PCIA is recovered from both  
11 bundled and departing load customers. The PCIA assigns costs responsibility for  
12 vintages of generation resources based upon when the customer departed bundled  
13 service. The PABA is comprised of subaccounts for each year's vintage portfolio that  
14 records the costs and revenues associated with the categories of activity for all  
15 generation resources executed or approved by the Commission for cost recovery that  
16 year.

17 Activity recorded to the PABA include the following categories: Revenues from  
18 Customers; Renewable Portfolio Standard (RPS) Activity; Resource Adequacy (RA)  
19 Activity; Adopted Utility Owned Generation (UOG) Revenue Requirements; California  
20 Independent System Operator (CAISO) Related Charges and Revenues, Fuel Costs,  
21 Contract Costs, Greenhouse Gas (GHG) costs, and Miscellaneous costs.

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<sup>414</sup> PG&E Advice Letter 5440-E available at  
[https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_5440-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5440-E.pdf), accessed on May 5, 2022.

<sup>415</sup> PG&E's PABA Electric Preliminary Statement Part HS available at  
[https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC\\_PRELIM\\_HS.pdf](https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_PRELIM_HS.pdf), accessed on May 5, 2022.

Table 8-1 below reflects PG&E's PABA accounting entries for the Record Period.

**Table 8-1**  
**PG&E PABA Accounting Entries<sup>416</sup>**  
**Record Period 2021**

PABA Beginning Balance – 1/1/2021	\$191,305,784.74
PABA Net Activity Before Interest <sup>417</sup>	\$(290,849,839.38)
PABA Net Interest	\$32,880.65
PABA Ending Balance – 12/31/2021	\$(99,511,174.00)
PCIA <sup>418</sup> Subaccount Beginning Balance	\$0
PCIA Subaccount Ending Balance	\$0
<b>Total PABA Ending balance – 12/31/2021</b>	<b>\$(99,511,174.00)</b>

#### **IV. CAL ADVOCATES AUDIT OBJECTIVES, SCOPE AND PROCEDURES**

Cal Advocates reviewed PG&E's PABA for the Record Period to determine whether entries recorded in the PABA were appropriate, correctly stated, and compliant with applicable Commission Decisions. Cal Advocates' audit procedures included, but were not limited to the following:

- Review of PG&E's application, testimony, exhibits, workpapers and data request responses;
- Review of applicable advice letters, resolutions, and Commission Decisions;
- Review of monthly entries, including reviews of monthly balances recorded for each of the tariff line items in the PABA during the record period, and evaluation of monthly and annual fluctuations;

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<sup>416</sup> PG&E Direct Testimony, Chapter 12,-Table 12-8.

<sup>417</sup> Amount includes PABA Revenues, Net of Revenue Fees and Uncollectible (RF&U) (credit) totaling \$2,523,434,291.02 and PABA Net Costs and Expenses (debit) totaling \$2,232,584,451.64.

<sup>418</sup> Power Charge Indifference Adjustment.

- Selection of a sample of PABA monthly tariff line items to determine whether adequate support exists. Sampling items within the PABA to decide if there is adequate support for item's correct vintaging. Examination of invoices, journals, general ledger entries, etc. for amounts recorded in the PABA and to verify the mathematical accuracy of accounting worksheets and review of supporting documentation;
- Cal Advocates attended a virtual meeting with PG&E staff to discuss each of the selected PABA monthly and tariff line items in detail and to trace those items to supporting documents;
- Review of proof of payments for selected invoices during the audit process;
- Review of monthly interest rates and the interest amount calculations;
- Determination of whether revenues and costs recorded were appropriate and correctly stated; and
- Determination of whether PG&E complied with applicable Commission Decisions and advice letter resolutions.

Cal Advocates reviewed a sampling of source documents to verify the revenues, costs, and expenses recorded in the PABA. Cal Advocates' sample was judgmentally selected and consisted of 37 monthly tariff line items recorded into the PABA. A "judgement sample" is a nonrandom sample selected by the auditor based on the judgment (opinion) of the auditor. Items considered when selecting a judgment sample include auditor judgments about various elements, including but not limited to the internal control environment, exposure/ materiality, risk, and results of analytical reviews.

## **V. CONCLUSION**

Cal Advocates found that the 2021 accounting entries recorded into PABA were reasonable, correctly stated, and in compliance with applicable Commission Decisions. Cal Advocates recommends the 2021 accounting entries recorded into PABA be accepted as filed.

1     **CHAPTER 9 SUMMARY OF ENERGY RESOURCE RECOVERY ACCOUNT**  
2                     **ENTRIES FOR THE RECORD PERIOD**

3                     (Witness: Brian Lui)  
4

5     **I.     INTRODUCTION AND SUMMARY**

6             Cal Advocates reviewed chapter 13 of PG&E's 2021 Energy Resource Recovery  
7     Account (ERRA) testimony for Record Period January 1, 2021 through December 31,  
8     2021. As of December 31, 2021 the balance in PG&E's ERRA balancing account was  
9     an under-collection of \$99.64 million.

10    **II.    RECOMMENDATION**

11            Cal Advocates found that the 2021 accounting entries recorded into ERRA  
12    appropriate, correctly stated, and in compliance with applicable Commission Decisions.  
13    Cal Advocates recommends the 2021 accounting entries recorded into ERRA be  
14    accepted as filed.

15    **III.   BACKGROUND**

16            Pursuant to D.02-10-062, D.02-12-074 and Public Utilities Code Section  
17    454.5(d)(3), the purpose of the ERRA balancing account was to account for the actual  
18    ERRA revenues and electric procurement costs for revenue recovery. The ERRA  
19    balancing account was substantially modified by D.18-10-019, issued in the Power  
20    Charge Indifference Adjustment (PCIA) rulemaking R.17-06-026. D.18-10-019 ordered  
21    the implementation of the Portfolio Allocation Balancing Account (PABA) and included  
22    revisions to the ERRA balancing account. The revised ERRA records power costs  
23    applicable solely to PG&E's bundled customers. Power costs incurred on behalf of both  
24    bundled and departing load customers are recorded either in the PABA, the Modified  
25    Transition Cost Balancing Account, the New System Generation Balancing Account  
26    (NSGBA), the Tree Mortality Non-Bypassable Charge Balancing Account, or the

Bioenergy Market Adjusting Tariff (BioMAT) Non-bypassable Charge Balancing Account.<sup>419</sup>

Table 9-1 below reflects ERRA's accounting entries for the Record Period.

**Table 9-1**  
**PG&E ERRA Accounting Entries<sup>420</sup>**  
**Record Period 2021**

Line No		Amount (\$)
1	ERRA Beginning Balance – 1/1/2021	\$6.25
2	ERRA Net Activity Before Interest <sup>421</sup> - FY 2021 YTD	\$287,600,912.57
3	ERRA Interest and Other	\$97,641.41
4 (Line 1+2+3)	ERRA Ending Balance	\$287,698,560.22
5	PCIA <sup>422</sup> Subaccount Beginning Balance	\$(271,523,521.46)
6	PCIA Subaccount Net Activity – FY 2021 YTD	\$83,463,077.88
7 (Line 4+5+6)	<b>Total ERRA Ending balance – 12/31/2021</b>	\$99,638,116.63

#### IV. CAL ADVOCATES AUDIT OBJECTIVES, SCOPE, AND PROCEDURES

Cal Advocates reviewed PG&E's ERRA for the Record Period to determine whether entries recorded in the ERRA were appropriate, correctly stated, and compliant with applicable Commission Decisions. Cal Advocates' audit procedures included, but were not limited to, the following:

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<sup>419</sup> PG&E Direct Testimony Chapter 13, Lines 19-23 and Footnote 2.

<sup>420</sup> PG&E Direct Testimony Chapter 13, Table 13-2.

<sup>421</sup> Amount includes ERRA Revenues (credit) totaling \$2,658,343,883.07 and ERRA Net Costs and Expenses (debit) totaling \$2,945,944,795.64.

<sup>422</sup> Power Charge Indifference Adjustment.

- 1 • Review of PG&E’s application, testimony, exhibits, workpapers  
2 and data request responses;
- 3 • Review of applicable advice letters, resolutions, and Commission  
4 Decisions;
- 5 • Review of monthly entries, including reviews of monthly  
6 balances recorded for each of the tariff line items in the ERRA  
7 during the record period, and evaluation of monthly and annual  
8 fluctuations;
- 9 • Selection of a sample of ERRA monthly tariff line items to  
10 determine whether adequate support exists. Examination of  
11 invoices, journals, general ledger entries, etc. for amounts  
12 recorded in the ERRA balancing account, and to verify the  
13 mathematical accuracy of accounting worksheets and review  
14 supporting documentation. Cal Advocates attended an online  
15 review to discuss each of the selected ERRA monthly and tariff  
16 line items in detail and to trace those items to supporting  
17 documents;
- 18 • Review of proof of payments for selected invoices during the  
19 audit process;
- 20 • Review of monthly interest rates and the interest amount  
21 calculations;
- 22 • Determination of whether revenues and costs recorded were  
23 appropriate and correctly stated; and
- 24 • Determination of whether PG&E complied with applicable  
25 Commission Decisions and advice letter resolutions.

26 Cal Advocates reviewed a sampling of source documents that support the  
27 revenues, costs, and expenses recorded in the ERRA. Cal Advocate’s sample was  
28 judgmentally selected and consisted of 32 monthly tariff line items recorded into the  
29 ERRA. A “judgment sample” is a nonrandom sample selected by the auditor based on  
30 the judgment (opinion) of the auditor. Items considered when selecting a judgment  
31 sample include auditor judgments about various elements including but not limited to the  
32 internal control environment, exposure/ materiality, risk, and results of analytical  
33 reviews.

1   **V.     CONCLUSION**

2           Cal Advocates found that the 2021 accounting entries recorded into ERRRA were  
3   reasonable, correctly stated, and in compliance with applicable Commission Decisions.

**CHAPTER 10 REVIEW ENTRIES RECORDED IN THE DISADVANTAGED  
COMMUNITY – SINGLE FAMILY AFFORDABLE SOLAR HOMES  
BALANCING ACCOUNT AND THE DISADVANTAGED COMMUNITY –  
SINGLE FAMILY AFFORDABLE SOLAR HOMES MEMORANDUM  
ACCOUNT**

(Witness: Brian Lui)

## I. INTRODUCTION AND SUMMARY

This testimony addresses Chapter 15 of PG&E’s 2021 Energy Resource Recovery Account (ERRA) compliance application, which covers the Disadvantaged Community – Single Family Affordable Solar Homes Memorandum Account (DACSASHMA) and Disadvantaged Community – Single Family Affordable Solar Homes Balancing Account (DACSASHBA) for the Record Period of January 1, 2021 through December 31, 2021. The DACSASHBA is a sub-account of PG&E’s Public Policy Charge Balancing Account (PPCBA).

## II. RECOMMENDATIONS

Cal Advocates recommends the DACSASHBA be accepted as filed. Cal Advocates does not object to PG&E's request to retire the DACSASHMA.

### III. BACKGROUND

Assembly Bill 327 required the Commission to develop alternative programs to increase the adoption and growth of renewable generation in disadvantaged communities. Commission Decision (D.) 18-06-027 adopted the Disadvantaged Community – Single-Family Affordable Solar Housing (DAC SASH) Program, along with the Disadvantaged Community Green Tariff (DAC-GT) and Community Solar Green Tariff (CS-GT) programs.

PG&E filed Advice Letter 5351-E establishing the Public Purpose Charge Balancing Account (PPCBA) with two subaccounts to track the costs and revenues associated with the DAC-GT and CS-GT programs.

Pursuant to Ordering Paragraph 8 of D.18-06-027, the DAC SASH Program has an annual budget of \$10 million per year beginning on January 1, 2019 and continuing through the end of 2030. PG&E's proportionate share of the \$10 million per year is

43.7 percent, or \$4.37 million per year.<sup>423</sup> In accordance with D.18-06-027, PG&E filed Advice Letter 5363-E to implement the DACSASHBA.<sup>424</sup> PG&E Advice Letter 5363-E was approved by the Commission on January 24, 2019 and effective as of September 19, 2018.

D.18-06-027 also required that start-up costs for the DAC SASH program be tracked in a memorandum account and reviewed in each investor-owned-utility's ERRA proceeding.<sup>425</sup> PG&E filed Advice Letter 5361-E to establish the DACSASHMA.<sup>426</sup> PG&E Advice Letter 5361-E was approved by the Commission on December 14, 2018 and effective as of August 20, 2018.

Table 10-1 below reflects DACSASHBA's expenses for the Record Period.

**Table 10-1**  
**PG&E DACSASHBA Recorded Expenses<sup>427</sup>**  
**Record Period 2021**

Line No	Description	Amount (\$)
1	PG&E Program Management	\$30,024
2	Program Administrator (PA) Administrative Expenses	\$513,607
3	Incentives	\$2,659,677
	Total	\$3,203,808

<sup>423</sup> D.18-06-027, Appendix A, P. A-6.

<sup>424</sup> PG&E Advice Letter 5363-E [https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_5363-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5363-E.pdf), accessed on May 5, 2022.

<sup>425</sup> D.18-06-027 Ordering Paragraph 10, p. 103.

<sup>426</sup> PG&E Advice Letter 5361-E [https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_5361-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5361-E.pdf), accessed on May 5, 2022.

<sup>427</sup> PG&E Direct Testimony, Table 15-1, p. 15-2.

1 For the 2021 record period, no additional start-up costs and no additional expenses  
2 were incurred in the DACSASHMA.<sup>428</sup> PG&E requests to retire the DACSASHMA in  
3 this ERRA Compliance proceeding.<sup>429</sup>

#### 4 **IV. CAL ADVOCATES ANALYSIS**

5 Cal Advocates reviewed PG&E's testimony, workpapers, and PG&E's responses  
6 to data requests. Cal Advocates also reviewed a sampling of source documents that  
7 support the expenses and revenues recorded in the DACSASHBA. Cal Advocates  
8 selected a sample of monthly line items to determine whether there is adequate support  
9 for those transactions. Cal Advocates' audit sample was judgmentally selected and  
10 consisted of 6 items recorded in DACSASHBA. A "judgment sample" is a non-random  
11 sample selected by the auditor based on the judgment (opinion) of the auditor. When  
12 selecting a judgment sample, an auditor makes judgments about various elements  
13 including but not limited to the internal control environment, exposure/ materiality, risk,  
14 and results of analytical reviews.

#### 15 **V. CONCLUSION**

16 Cal Advocates recommends the DACSASHBA be accepted as filed. Cal  
17 Advocates does not object to PG&E retiring the DACSASHMA.

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<sup>428</sup> PG&E Direct Testimony, p. 15-3 lines 26 through 29 and p. 15-4 lines 1 – 3.

<sup>429</sup> PG&E Direct Testimony, p. 15-4 lines 2 – 3.

1 **CHAPTER 11 CENTRAL PROCUREMENT ENTITY ENTRIES RECORDED TO**  
2 **THE CENTRALIZED LOCAL PROCUREMENT SUB-ACCOUNT**

3 (Witness: Brian Lui)

4 **I. INTRODUCTION AND SUMMARY**

5 This testimony addresses Chapter 16 of PG&E's 2021 Energy Resource Recovery  
6 Account (ERRA) compliance application, which covers the administrative costs for the  
7 Central Procurement Entity (CPE) recorded to the Centralized Local Procurement  
8 Sub-Account (CLPSA) for the Record Period of January 1, 2021 through December 31,  
9 2021.

10 **II. RECOMMENDATIONS**

11 Cal Advocates recommends the CPE administrative costs recorded in the CLPSA  
12 for the 2021 Record Period be accepted as filed.

13 **III. BACKGROUND**

14 The Commission issued Decision (D.) 20-06-002 on June 17, 2020. D.20-06-002  
15 ordered PG&E to serve as the CPE for PG&E's distribution service area for the multi-  
16 year local Resource Adequacy (RA) program beginning for the 2023 RA compliance  
17 year.<sup>430</sup> D.20-06-002 directed PG&E to submit the administrative costs in the ERRA  
18 forecast and compliance proceedings.<sup>431</sup>

19 The Commission approved PG&E Advice Letter (AL) 5919-E, effective  
20 September 16, 2020.<sup>432</sup> PG&E AL 5919-E established the CLPSA as a sub-account of  
21 the New System Generation Balancing Account (NSGBA). The CPE administrative  
22 costs are among other costs outlined in the CLPSA. This chapter and PG&E chapter 16  
23 deal solely with the CPE administrative costs in the CLPSA.

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<sup>430</sup> D.20-06-002, p. 91, Ordering Paragraph 2.

<sup>431</sup> Ibid, p. 55-56.

<sup>432</sup> PG&E AL 5919-E available at: [https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_5919-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5919-E.pdf). Accessed May 5, 2022.

Table 11-1 below reflects PG&E’s CPE administrative costs for the Record Period.

**Table 11-1**  
**PG&E CPE Administrative Costs<sup>433</sup>**  
**Record Period 2021**

Line No	Description	Amount (\$)
	<u>CPE Systems Implementation Costs</u>	
1	Labor	2,140,535
2	Overhead	171,567
3	O&M/Software License Costs	249,446
	<u>CPE Implementation Team and Supporting Function Costs</u>	
4	Labor	2,166,868
	Overhead	3,345
5	Independent Evaluator (IE) Cost	116,767
6	Total	\$4,848,528

#### IV. CAL ADVOCATES ANALYSIS

Cal Advocates reviewed PG&E’s testimony, workpapers, and PG&E’s responses to data requests. Cal Advocates also reviewed a sampling of source documents that support the administrative costs recorded in the CLPSA. Cal Advocates selected a sample of monthly line items to determine whether there is adequate support for those transactions. Cal Advocates’ audit sample was judgmentally selected and consisted of 11 items recorded in the CLPSA. A “judgment sample” is a non-random sample selected by the auditor based on the judgment (opinion) of the auditor. When selecting a judgment sample, an auditor makes judgments about various elements including but not limited to the internal control environment, exposure/ materiality, risk, and results of analytical reviews.

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<sup>433</sup> PG&E Direct Testimony, Table 16-1.

41   **V.     CONCLUSION**

42           Cal Advocates recommends the CPE administrative costs recorded in the CLPSA  
43   for the 2021 Record Period be accepted as filed.

**APPENDIX A**  
**QUALIFICATIONS OF WITNESESS**

**QUALIFICATIONS AND PREPARED TESTIMONY  
OF  
KARL STELLRECHT**

**Q.1 Please state your name and business address.**

A.1 My name is Karl Stellrecht and my business address is 505 Van Ness Avenue, San Francisco, CA 94102. I am a Public Utilities Regulatory Analyst in the Electric Pricing and Customer Programs Branch of the Office of Ratepayer Advocates.

**Q.2 By whom are you employed and in what capacity?**

A.2 I am employed by the California Public Utilities Commission as a Public Utilities Regulatory Analyst in the Public Advocates Office.

**Q.3 Briefly state your educational background and experience.**

A.3 I have a Bachelor of Arts in Environmental Studies from the University of California, Santa Barbara, and a Masters of Arts in International Environmental Policy from the Monterey Institute of International Studies. I started working at the Commission in 2017 in the Public Advocates Office's Electricity Planning and Policy Branch. In the Public Advocates Office, I am involved in the ERRA Forecast and Compliance proceedings as well as Direct Access and Provider of Last Resort Proceedings. I also contributed testimony in the Oakland Clean Energy Initiative proceeding. My previous experience includes working on energy industry issues for the consulting firm Eastern Research Group and as a program coordinator at the National Association of Regulatory Utility Commissioners (NARUC).

**Q.4 What is the scope of your responsibility in this proceeding?**

A.4 I am the Project Coordinator and am responsible for Chapter 1 – Executive Summary.

**Q.5 Does this complete your testimony at this time?**

A.5 Yes, it does.

**PREPARED TESTIMONY AND QUALIFICATIONS  
OF  
STANLEY KUAN**

**Q1. Please state your name, business address, and position with Cal Advocates.**

A1. My name is Stanley Kuan and my business address is 505 Van Ness Avenue, San Francisco, California. I work in the Electricity Planning and Policy Branch of Cal Advocates as a Regulatory Analyst.

**Q2. Please summarize your education background and professional experience.**

A2. I graduated from University of California, San Diego with a B.A. in Economics. I also obtained a law degree from the George Washington University Law School in Washington D.C. I have been employed by Cal Advocates on the Procurement Cost Recovery team of the Electricity Planning and Policy Branch for 1 year and 9 months. Before that, I was an analyst with the Cal Advocates on the Customer Programs team of the Electric Pricing and Customer Programs Branch for approximately 4 years. In my experience at the CPUC, I have worked on or am working on proceedings related to the Energy Resources Recovery Account (ERRA), the Power Charge Indifference Adjustment (PCIA) Rulemaking (R.17-06-026), the Net Energy Metering (NEM) Disadvantaged Communities (DAC) (Rulemaking (R.) 14-07-002, San Joaquin Valley (SJV) DAC proceeding (R.15-03-010), Demand Response Auction Mechanism (DRAM) (Application (A.) 17-01-012, SDG&E Maritime Rate Application (A.17-09-005).

**Q3. What is your responsibility in this proceeding?**

A3. I am responsible for Chapter 2 “Least Cost Dispatch.”

**Q4. Does this conclude your prepared direct testimony?**

A4. Yes, it does.

1                                   **QUALIFICATIONS AND PREPARED TESTIMONY**  
2   **OF**  
3   **MICHAEL YEO**  
4

5   **Q.1    Please state your name and business address.**

6   A.1    My name is Michael Yeo. My business address is 505 Van Ness Avenue,  
7           San Francisco, California.  
8

9   **Q.2    By whom are you employed and in what capacity?**

10   A.2   I am employed by the California Public Utilities Commission as a Senior Utilities  
11           Engineer in the Public Advocates Office.  
12

13   **Q.3    Briefly state your educational background and experience.**

14   A.3   I graduated from the University Of Toronto with a Bachelor of Applied Science in  
15           Civil Engineering, and am a registered Professional Engineer. Since joining the  
16           Commission in 1992, I have worked in various assignments in the Public  
17           Advocates Office, Energy Division and the Consumer Protection and Safety  
18           Division. Immediately prior to joining the Commission, I worked for the  
19           California Department of Transportation.  
20

21   **Q.4    What is the scope of your responsibility in this proceeding?**

22   A.4   I am responsible for Chapter 3 – Utility-Owned Generation – Hydroelectric.  
23

24   **Q.5    Does this complete your testimony at this time?**

25   A.5   Yes, it does.  
26

1                                   **QUALIFICATIONS AND PREPARED TESTIMONY**  
2   **OF**  
3   **KYLE NAVIS**  
4

5   **Q.1    Please state your name and business address.**

6   A.1    My name is Kyle Navis and my business address is 505 Van Ness Avenue,  
7           San Francisco, CA 94102. I am a Public Utilities Regulatory Analyst in the  
8           Electricity Planning and Policy Branch of the Office of Ratepayer Advocates.  
9

10   **Q.2   By whom are you employed and in what capacity?**

11   A.2    I am employed by the California Public Utilities Commission as a Public Utilities  
12           Regulatory Analyst in the Public Advocates Office.  
13

14   **Q.3   Briefly state your educational background and experience.**

15   A.3    I have a Bachelor of Arts in Peace Studies from Whitworth University (Spokane,  
16           WA), and a Master of Arts in International Affairs from the University of  
17           California, San Diego. I started working at the Commission in 2020 in the  
18           Electricity Planning and Policy Branch. In the Public Advocates Office, I am  
19           involved in ERRRA Compliance proceedings as well as the Resource Adequacy,  
20           Emergency Reliability, Integrated Resource Planning, and Provider of Last Resort  
21           proceedings. I also contribute to Public Advocates Office engagement at the  
22           California Independent System Operator's Resource Adequacy Enhancements  
23           stakeholder initiative. My previous experience includes researching the use of  
24           mobile platforms for delivering government services at the Center For Global  
25           Development (Washington, DC), managing community development programs for  
26           the Mennonite Central Committee (Santa Cruz, Bolivia), and teaching science for  
27           the School District of Philadelphia (PA).  
28

29   **Q.4   What is the scope of your responsibility in this proceeding?**

30   A.4    I am the witness for Chapter 7 – Contract Administration.  
31

32   **Q.5   Does this complete your testimony at this time?**

33   A.5    Yes, it does.  
34

1                                   **QUALIFICATIONS AND PREPARED TESTIMONY**  
2   **OF**  
3   **PATRICK CUNNINGHAM**  
4

5   **Q.1    Please state your name and business address.**

6   A.1    My name is Patrick Cunningham. My business address is 505 Van Ness Avenue,  
7           San Francisco, CA 94102.  
8

9   **Q.2    By whom are you employed and what is your job title?**

10   A.2   I am employed by the California Public Utilities Commission as a Public Utilities  
11           Regulatory Analyst in the Electricity Planning and Policy Branch of the Public  
12           Advocates Office.  
13

14   **Q.3    Will you please briefly state your educational background and experience?**

15   A.3    I hold a Master of Pacific and International Affairs degree from the University of  
16           California San Diego, a Master of Arts degree in History from the American  
17           Military University, and a Bachelor of Arts degree in History from the University  
18           of California Santa Cruz. I joined the Public Advocates Office in May of 2016  
19           and have devoted my work to the study and analysis of ERRA cases, associated  
20           Commission decisions, and resource adequacy policies. For the ERRAs of  
21           investor-owned utilities, I have conducted analysis as the expert witness of least-  
22           cost dispatch eight times and contract administration seven times. I have also been  
23           the expert witness for hydroelectric administration for PG&E's 2016 ERRA and  
24           resource adequacy for PG&E's 2019 ERRA. I also coordinated and conducted  
25           analysis on SDG&E's 2018 ERRA Forecast and SCE's 2020 and 2021 ERRA  
26           Forecasts.  
27

28   **Q.4    What testimony are you sponsoring in this proceeding?**

29   A.4    I am responsible for analysis and the testimony of the contract administration of  
30           testimony.  
31

32   **Q.5    Does this complete your testimony at this time?**

33   A.5    Yes, it does.  
34

1 **QUALIFICATIONS AND PREPARED TESTIMONY**  
2 **OF**  
3 **BRIAN LUI**  
4

5 **Q.1 Please state your name and business address.**

6 A.1 My name is Brian Lui. My business address is 505 Van Ness Ave, San Francisco,  
7 California, 94102.  
8

9 **Q.2 By whom are you employed and in what capacity?**

10 A.2 I am employed by the California Public Utilities Commission (CPUC) as a Public  
11 Utilities Financial Examiner in the Public Advocates Office, Electricity Planning  
12 & Policy Branch.  
13

14 **Q.3 Please describe your educational and professional experience.**

15 A.3 I hold a Masters Degree in Accounting from Golden Gate University in  
16 San Francisco. I also received a Bachelors of Science Degree in Biochemistry  
17 from the University of California, Riverside. I joined the Commission on January  
18 7, 2014 in the Public Advocates Office's Electricity Planning and Policy Branch.  
19 In the Public Advocates Office, I am involved in the ERRA Forecast and ERRA  
20 Compliance proceedings. Immediately prior to joining the Commission, I worked  
21 for the California State Board of Equalization as a tax auditor. I have over 9 years  
22 of experience working as an auditor in the public sector.  
23

24 **Q.4 What is the scope of your responsibility in this proceeding?**

25 A.4 I am responsible for:

- 26 • Chapter 4: Review Entries Recorded in the Disadvantaged Community  
27 – Green Tariff Balancing Account and the Community Solar Green  
28 Tariff Balancing Account;
- 29 • Chapter 5: Generation Fuel Costs;
- 30 • Chapter 9: Review Entries Recorded in the Green Tariff Shared  
31 Renewables Memorandum Account and the Green Tariff Shared  
32 Renewables Balancing Account;
- 33 • Chapter 10: Summary of Portfolio Allocation Balancing Account  
34 Entries for the Record Period;
- 35 • Chapter 11: Summary of Energy Resource Recovery Account Entries  
36 for the Record Period;

- Chapter 12: Review Entries Recorded in the Disadvantaged Community – Single Family Affordable Solar Homes Balancing Account and the Disadvantaged Community – Single Family Affordable Solar Homes Memorandum Account; and
- Chapter 13: Central Procurement Entity Entries Recorded to the Centralized Local Procurement Sub-Account.

**Q.5 Does this complete your testimony at this time?**

**A.5** Yes, it does.

**APPENDIX B**

**ATTACHMENTS**

**PUBLIC VERSION**

## LIST OF ATTACHMENTS FOR CHAPTER 2

#	Attachment	Description
1	Attachment 2.1 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008 - PG&E Chapter 1 Workpapers, 2020_LCD_2_Bid_Cost_Calculation_CONF, “CLEAN_VS_CALC” tab
2	Attachment 2.2 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008 – PG&E Chapter 1 Workpapers, 2020_LCD_2_Bid_Cost_Calculation_CONF, Table 2.1.2-Annual Comparison
3	Attachment 2.3 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_3_SelfCommitment_CONF
4	Attachment 2.4 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_6_Highest_Energy_Value_Days_and_Price_Forecast_Summary_CONF.
5	Attachment 2.5 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_6_HighestEnergyValueDays_CONF.
6	Attachment 2.6 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_Workpaper_6_HighestEnergyValueDays_CONF
7	Attachment 2.7 (CONFIDENTIAL) (Available via e-mail only)	A.20-02-009, Chapter 1 Workpapers, 2019_LCD_Workpaper_6_HighestEnergyValueDays_CONF
8	Attachment 2.8	ERRA-2021-PGE-Compliance_DR_CalAdvocates_019-Q002, July 25, 2022
9	Attachment 2.9 (CONFIDENTIAL) (Available via e-mail only)	Public Advocates Office Workpapers, 2021-LCD_Workpaper_6_HighestEnergyValueDays_CONF
10	Attachment 2.10 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_7_Load_Bid_CONF.xlsx

11	Attachment 2.11 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_Workpaper_7_Load_Bid_CONF
12	Attachment 2.12 (CONFIDENTIAL) (Available via e-mail only)	Public Advocates Office Workpapers, 2021_LCD_Workpaper_7_Load_Bid_CON
13	Attachment 2.13 (CONFIDENTIAL)	A.22-05-015, Chapter 1 Workpapers, 2021_LCD_2_Bid_Cost_Calculation_ Summary
14	Attachment 2.14 (CONFIDENTIAL) (Available via e-mail only)	A.22-05-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_2_BidCostCalculation_ CONF, Table 2.2-Annual Non-Award
15	Attachment 2.15 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_Workpaper_2_BidCostCalculation_ CONF, “Table 2.5 – Annual Non-Bid” tab
16	Attachment 2.16 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_3_SelfCommitment_Summary_ CONF
17	Attachment 2.17 (CONFIDENTIAL)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_4_Hydro_Resources_Summary_ CONF
18	Attachment 2.18 (CONFIDENTIAL) (Available via e-mail only)	A.22-02-015, Chapter 1 Workpapers, 2021_LCD_4_Hydro_Top_500_CONF, “Table 4.3 Hydro Stat” tab
19	Attachment 2.19 (CONFIDENTIAL) (Available via e-mail only)	A.21-03-008, Chapter 1 Workpapers, 2020_LCD_4_Hydro_Top_500_CONF, “Table 4.3 Hydro Stat” tab
20	Attachment 2.20 (Available via e-mail only)	A.20-02-009, Chapter 1 Workpapers, 2019_LCD_4_Hydro_Top_500, “Table 4.3 Hydro Stat” tab
21	Attachment 2.21 (Available via e-mail only)	2021_LCD_Workpaper_1_CommitmentCostDeci sions

## **CHAPTER 2**

### **ATTACHMENT 2.1**

**A.21-03-008 - PG&E Chapter 1 Workpapers,  
2020\_LCD\_2\_Bid\_Cost\_Calculation\_CONF,  
“CLEAN\_VS\_CALC” tab**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.2**

**A.21-03-008 – PG&E Chapter 1 Workpapers,  
2020\_LCD\_2\_Bid\_Cost\_Calculation\_CONF, Table  
2.1.2-Annual Comparison**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.3**

**A.21-03-008, Chapter 1 Workpapers,  
2020\_LCD\_3\_SelfCommitment\_CONF**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.4**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_6\_Highest\_Energy\_Value\_  
Days\_and\_Price\_Forecast\_Summary\_CONF.**

**CONFIDENTIAL**

## Chapter 1 – Least Cost Dispatch Workpaper 6 – Highest Energy Value Days and Price Forecast Summary

### ❖ Background

This workpaper identifies the 100 highest energy value days during the 2021 record period and provides a comparison between the daily average default load aggregation point (“DLAP”) price forecast, used in PG&E’s day-ahead least-cost dispatch process, and the daily average cleared day-ahead market (“DAM”) DLAP price for the PG&E area.

### ❖ Highlights

This workpaper ranks the 100 highest energy value days based on total cost of load cleared in the day-ahead market, which is calculated as the sum of the hourly products of cleared day-ahead load and cleared day-ahead price. The data for PG&E’s cleared day-ahead DLAP load, actual settled DLAP load, and cleared DLAP prices are obtained from California Independent System Operator (“CAISO”) settlement statements.

In this workpaper, PG&E uses mean absolute percentage error (“MAPE”) to measure the accuracy of PG&E’s price forecast. During the 100 highest energy value days, the price forecast yielded an average daily MAPE of [REDACTED]

### ❖ Calculation of Price Forecast MAPE

The average daily MAPE is calculated as the average of the MAPEs for every hour of the day, using hourly forecasted day-ahead PG&E DLAP prices and hourly cleared day-ahead PG&E DLAP prices. For the 2021 record period, the average daily MAPE was calculated as follows (with  $t$  referring to the hour):

$$\text{Daily MAPE} = \frac{1}{24} * \sum_{t=1}^{24} \frac{|\text{Forecasted Price}_t - \text{Cleared Price}_t|}{\text{Daily Average Cleared Price}}$$

This is the same formula used in the previous EERRA filing (2020 record period).

### ❖ Evaluation of Price Forecast MAPE

In 2021, most of the high daily MAPEs occurred when hourly prices dropped to very low values during low load Spring months and when prices increased to abnormally high values, e.g., during the severe winter storm across the central and mid-continent United State that occurred in February<sup>1</sup>. It is generally well-recognized that forecasting

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<sup>1</sup> See Section 1.1 Supply Conditions of the CAISO’s Department of Market Monitoring’s Q1 2021 Market Issues and Performance Report for details of the February cold event. Link: <http://www.caiso.com/Documents/2021-First-Quarter-Report-on-Market-Issues-and-Performance-Jun-9-2021.pdf>

algorithms are trained to perform well on average, and forecasting extremes is an industry-wide challenge. The average 2021 MAPE of 100 highest energy value days decreased slightly from the 2020 average of [REDACTED] to the 2021 average of [REDACTED]

❖ **Contents in '6 – Highest Energy Value Days' Folder**

**'LCD\_Workpaper\_6\_HighestEnergyValueDays.xlsx' – Tab Descriptions**

- Table 6.1 – Highest Energy Value Days Based on (DAM DLAP Load \* DAM DLAP Price): Summary table of the 100 highest energy value days ranked by total cost of load cleared in the day-ahead market, with columns for total actual settled load, average hourly day-ahead cleared load, average hourly actual settled load, average forecasted day-ahead PG&E DLAP price, and average cleared day-ahead PG&E DLAP price. Table 6.1 also includes the average daily MAPE of the forecasted day-ahead PG&E DLAP prices for each of the 100 highest energy value days.
- Table 6.2 – Daily Price Forecast: A summary of price forecast accuracy for all days during the record period.

## **CHAPTER 2**

### **ATTACHMENT 2.5**

**A.22-02-015, Chapter 1 Workpapers, 2021-  
LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF.**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.6**

**A.21-03-008, Chapter 1 Workpapers,  
2020\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_  
CONF**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.7**

**A.20-02-009, Chapter 1 Workpapers,  
2019\_LCD\_Workpaper\_6\_HighestEnergyValueDays\_  
CONF**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.8**

**ERRA-2021-PGE-  
Compliance\_DR\_CalAdvocates\_019-Q002,  
July 25, 2022**

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 019-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 019-Q002		
Request Date:	July 11, 2022	Requester DR No.:	019
Date Sent:	July 25, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Alva Svoboda	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 002**

The MAPE value for June 18 is exceptionally high due to an anomalously high forecast DAM DLAP price relative to the cleared ISO DAM DLAP Price.

a. What is the reason for this high forecast price?

**ANSWER 002**

PG&E's short term price forecasting vendor, Enverus, was contacted to help respond to these questions. Here is their response:

The reason for this high forecasted price was "Mostly due to higher-than-average temperatures forecasted for the NP-15 region for 6/17 & 6/18."

## **CHAPTER 2**

### **ATTACHMENT 2.9**

**Public Advocates Office Workpapers, 2021-  
LCD\_Workpaper\_6\_HighestEnergyValueDays\_CONF**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.10**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_Workpaper\_7\_Load\_Bid\_CONF.xlsx**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.11**

**A.21-03-008, Chapter 1 Workpapers,  
2020\_LCD\_Workpaper\_7\_Load\_Bid\_CONF**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.12**

**Public Advocates Office Workpapers,  
2021 LCD\_Workpaper\_7\_Load\_Bid\_CON**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.13**

**A.22-05-015, Chapter 1 Workpapers,  
2021\_LCD\_2\_Bid\_Cost\_Calculation\_Summary**

**(CONFIDENTIAL)**

## **Chapter 1 – Least Cost Dispatch**

### **Workpaper 2 – Bid Cost Calculation Summary**

#### **❖ Background**

Pursuant to California Public Utilities Commission (“CPUC”) Decision (D.) 15-12-015, this workpaper provides summary reporting of incremental bid cost calculations for dispatchable thermal resources in the 2021 record period. This includes the following: detailed supporting data of incremental bid cost calculations, variances between the calculated bids and actual submitted bids, cost impacts of variances, number of times resources were not bid into the California Independent System Operator (“CAISO”) market when available, and percentage of times incremental energy was not awarded when expected. All evaluations of variances between the calculated bids and actual submitted bids are based on a variance greater than \$0.10.

#### **❖ Highlights**

##### **Variances & Impact:**

Overall, there were variances in approximately 0.28% of total bid hours for dispatchable thermal resources during the record period. There was a \$976 estimated cost impact associated with these variances.

##### **Resources Not Awarded When Expected:**

PG&E provides an explanation for all instances during the record period in which a dispatchable thermal resource did not receive an award for incremental energy when the incremental bid cost was lower than the locational marginal price (“LMP”).

##### **Resources Not Bid When Available:**

PG&E submitted bids for dispatchable thermal resources during all hours when available.

#### **❖ Details**

PG&E submitted 582,648 day-ahead thermal bids during the 2021 record period. Of these thermal bids, there was one event (totaling 1,632 bid hours) that reflected variances of over \$0.10 between PG&E’s correctly calculated bids and the submitted bids. The 1,632 incorrect bids translate to an error rate of 0.28%. This error percentage is the same as the 2020 error rate of 0.28% but higher than the 2019 error rate of 0.00%.

The one event is described in detail below.



### **Resources Not Awarded When Expected**


*(See Tables 2.2, 2.4, and "Non-Award Details" tab)*

PG&E provides an explanation for all instances in which a dispatchable thermal resource did not receive incremental energy awards when the incremental bid cost at the awarded MW level was lower than the LMP at the applicable node. For all cases during the record period, these instances corresponded to defined categories, such as the resource receiving Ancillary Services spin awards in lieu of additional energy awards. The defined categories are described in greater detail in tables 2.2 and 2.4.

### **Resources That Were Not Bid When Available**

*(See Table 2.5)*

During the record period, PG&E submitted bids for dispatchable thermal resources during all hours when available.



### **❖ Contents in '2 - Bid Cost Calculation' Folder**

#### **'2021\_LCD\_Workpaper\_2\_BidCostCalculation\_CONF.xlsx' – Tab Descriptions**

- Table 2.1.1 - Annual Summary: Annual table depicting number of significant (greater than \$0.10) variances between calculated and actual submitted bids, along with any potential cost impacts.
- Table 2.1.2 – Annual Comparison: Annual variance table from the 2020 record period is included for comparative purposes, pursuant to CPUC D. 15-12-015.
- Table 2.2 - Annual Non-Award: Annual table depicting percentage of times incremental energy was not awarded when incremental bid cost at the awarded MW level was lower than the LMP at the applicable node.
- Table 2.3.1 - Monthly Summary: Monthly table depicting number of significant (greater than \$0.10) variances between calculated and actual submitted bids. (See Table 2.1.1 for Annual Summary).
- Table 2.3.2 - Monthly Summary: Monthly table depicting cost impacts of significant (greater than \$0.10) variances between calculated and actual submitted bids. (See Table 2.1.1 for Annual Summary).

- Table 2.4 - Monthly Non-Award: Monthly table depicting percentage of times incremental energy was not awarded when incremental bid cost at the awarded MW level was lower than the LMP at the applicable node. (See Table 2.2 for Annual Summary).
- Table 2.5 - Annual Non-Bid: Annual table depicting number of times resources were not bid into the CAISO market when available.
- Non-Award Details: Detailed information on instances in which incremental energy was not awarded when incremental bid cost at the awarded MW level was lower than the LMP at the applicable node.
- 2021 Clean vs Calc Details: Detailed information on the significant (greater than \$0.10) variances between calculated and actual submitted bids.

### **'2021\_Fuel\_Price\_VOM\_IHR\_GHG.xlsx' – Supporting Documentation Tab Descriptions\***

This file contains the fuel prices, variable operation and maintenance (“VOM”) costs, greenhouse gas (“GHG”) costs, and incremental heat rate (“IHR”) segments for all dispatchable thermal resources that PG&E bid into the CAISO market during the record period.

- Tab 'FP\_VOM' contains the fuel cost in \$/MMBtu and VOM cost in \$/MWh with daily granularity, sorted by resource ID (RESOURCE\_ID), bid date (BID\_DT), fuel price (FUEL\_PRICE), VOM (O\_AND\_M\_ADDER), transportation cost (TRANSPORT), other adders (OTHER\_ADDER), GHG cost (CARBON\_PRICE) and GHG emission factor (CARBON\_EMISSION\_FACTOR) . The same set of values is used for all hours of the corresponding day.
- Tab 'HEAT\_RATE\_SHIFT\_FINAL' lists the heat rate segments of all dispatchable thermal resources. The data is sorted by resource ID (RESOURCE\_ID), bid date (BID\_DT), bid hour (BID\_HR), and then by the heat rate curve's MW output level followed by the incremental heat rate.

## **CHAPTER 2**

### **ATTACHMENT 2.14**

**A.22-05-015, Chapter 1 Workpapers,  
2021\_LCD\_Workpaper\_2\_BidCostCalculation\_CONF,  
Table 2.2-Annual Non-Award**

**CONFIDENTIAL**

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## **CHAPTER 2**

### **ATTACHMENT 2.15**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_Workpaper\_2\_BidCostCalculation\_CONF,  
“Table 2.5 – Annual Non-Bid” tab**

**CONFIDENTIAL**

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## **CHAPTER 2**

### **ATTACHMENT 2.16**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_3\_SelfCommitment\_Summary\_CONF**

**CONFIDENTIAL**

This workpaper summarizes the daily self-commitment decisions for dispatchable thermal resources.

## ❖ Highlights

During the record period, [REDACTED]  
[REDACTED] There were no incidences of erroneous self-commitment during the record period.

### Self-Commitment Summary (See Tables 3.1, 3.2, and Detail)

PG&E reviewed self-commitment decisions made in the record period for dispatchable thermal resources. [REDACTED]

❖ **Contents in '3 – Self Commitment' Folder**

**'2021\_LCD\_Workpaper\_3\_SelfCommitment.xlsx' – Tab Descriptions**

- Table 3.1 - Annual Summary: Annual table summarizing number of hours when discretionary self-commitment decisions were made and the reasons, with reason codes.
- Table 3.2 - Monthly Summary: Monthly table summarizing number of hours when discretionary self-commitment decisions were made and the reasons, with reason codes. Note: During the record period, all instances of self-commitment were due to non-discretionary, unit testing purposes.
- Detail: Detailed information on all self-commitment decisions and whether the self-commitments were due to discretionary or non-discretionary reasons.



## **CHAPTER 2**

### **ATTACHMENT 2.17**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_4\_Hydro\_Resources\_Summary\_CONF**

**CONFIDENTIAL**

## **Chapter 1 – Least Cost Dispatch**

### **Workpaper 4 – Hydro Resources Summary**

#### **❖ Background**

This workpaper summarizes the California Independent System Operator (“CAISO”) awards for PG&E’s dispatchable hydro and pumped storage resources during the record period.

#### **❖ Highlights**

Table 4.3 of ‘LCD\_Workpaper\_4\_HydroSummary.xlsx’ indicates the percent at which available hydro and pumped storage resources were dispatched by the CAISO for energy or ancillary services during each resource location’s respective 500 highest day ahead locational marginal prices (“LMPs”) of the year. As use-limited resources, hydro units are typically awarded schedules during peak price periods. For the 2021 record period, the dispatchable hydro resources were used by the CAISO during [REDACTED] of the top 500 highest LMPs. Included with the workpaper are output Excel files from hydro modeling tools: PLEXOS (generated monthly), TESS (generated Monthly), and Xpress (generated daily, samples provided).

#### **❖ Contents in ‘4 – Hydro Resources’ Folder**

##### **‘LCD\_Workpaper\_4\_HydroSummary.xlsx’ – Tab Descriptions**

- Table 4.1 – Annual Summary: Annual table showing the sum of the total awarded megawatt-hours (“MWh”) and the average LMP when each resource was awarded schedules during the record period.
- Table 4.2 – Monthly Summary: Monthly table providing the sum of the total awarded MWh and the average LMP when each resource was awarded schedules for a given month.
- Table 4.3 – Hydro Stat: Annual table indicating the percent of the 500 highest LMP hours in which each available resource was awarded schedules for energy (“EN”) or ancillary services (“AS”) during each resource location’s respective 500 highest LMPs of the year.
- HYDRO\_HIGHEST: Hourly EN bid segment and AS details for each available resource for the 500 highest LMPs.
- HYDRO\_LMP\_RANK: LMP rankings over the entire year, along with detailed supporting data consisting of hourly bids, actual LMPs, and market results.

##### **‘PLEXOS’ Sub-Folder – Supporting Documentation**

PLEXOS is a tool for projecting optimal monthly hydropower generation used for all of the watersheds. The following are provided in the 'PLEXOS Spreadsheets' sub-folder:

- Full System Report (FSR): Excel files for each of the days in which a PLEXOS output was generated monthly.
- PLEXOS Outputs Description: Word document that provides details on interpreting the FSR Excel files.

### **'Xpress' Sub-Folder – Supporting Documentation**

For watersheds with economic dispatch capabilities, Xpress Optimization workbooks optimize hourly watershed operations over a multi-day horizon using the Xpress Optimization Suite based on user inputs of water storage and draft targets. Market operations personnel use Xpress models to prepare daily energy schedules for each of the following watersheds:

- Watershed Models: Monthly Excel files for the following watersheds:
  - Pit
  - Mokelumne
  - North Feather
  - Stanislaus
  - South Feather
  - San Joaquin
  - Kings

We have included a sample of one daily file per month in the attached subfolder. Additional daily files are available on request.

- Xpress Spreadsheets Description: Word document that provides details on interpreting the watershed model Excel files.

### **'TESS' Sub-Folder – Supporting Documentation**

The ("TESS") models are the primary scheduling tools for the Drum watershed. An hourly watershed simulation spreadsheet is used to simulate hourly watershed operations over a multi-day horizon based on user inputs of water targets. The TESS models are used by market operations personnel to prepare energy schedules. The following are included in this folder:

- Watershed Models: Monthly text model output files for the following watersheds:
  - Drum: YB TESS for (month) 2021

- TESS Outputs Description: Word document that provides details on interpreting the watershed model text files.

## **CHAPTER 2**

### **ATTACHMENT 2.18**

**A.22-02-015, Chapter 1 Workpapers,  
2021\_LCD\_4\_Hydro\_Top\_500\_CONF,  
“Table 4.3 Hydro Stat” tab**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.19**

**A.21-03-008, Chapter 1 Workpapers,  
2020\_LCD\_4\_Hydro\_Top\_500-CONF,  
“Table 4.3 Hydro Stat” tab**

**CONFIDENTIAL**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.20**

**A.20-02-009, Chapter 1 Workpapers,  
2019\_LCD\_4\_Hydro\_Top\_500,  
“Table 4.3 Hydro Stat” tab**

**(Available via e-mail only)**

## **CHAPTER 2**

### **ATTACHMENT 2.21**

#### **2021\_LCD\_Workpaper\_1\_CommitmentCostDecisions**

**(Available via e-mail only)**

### LIST OF ATTACHMENTS FOR CHAPTER 3

#	Attachment	Description
1	Attachment 3.1	PG&E Response to Cal Advocates Data Request 2, Question 1 to 42. inclusive
2	Attachment 3.2	PG&E Response to Cal Advocates Data Request 12, Question 1 to 102 inclusive.
3	Attachment 3.3 (CONFIDENTIAL) (Available via email only)	PG&E Response to Cal Advocates Data Request 12, Question 71.

## **CHAPTER 3**

### **ATTACHMENT 3.1**

**PG&E Response to Cal Advocates Data Request 2,  
Question 1 to 42 inclusive**

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q001		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q001		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 001**

What was the Application and the Commission Decision that approved the purchase/construction of Humboldt Bay Generating Station (Humboldt)?

**ANSWER 001**

PG&E objects to this question on grounds that it requests information outside the scope of this 2021 ERRA Compliance Proceeding, which includes review of PG&E's operation of Utility Owned Generation during the record period 2021.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q002		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 002**

What was the Application and the Commission Decision that approved the rate recovery of Humboldt?

**ANSWER 002**

PG&E objects to this question on grounds that it requests information outside the scope of this 2021 ERRA Compliance Proceeding, which includes review of PG&E's operation of Utility Owned Generation during the record period 2021.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q003		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q003		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 003**

What is Humboldt used for – base load, ancillary, peakers or other? Please explain its usage.

**ANSWER 003**

Humboldt provides base load and ancillary services. During high customer natural gas demand or unavailability of the gas transmission line feeding the Humboldt area, HBGS natural gas use is curtailed, requiring the facility to transfer to distillate fuel to generate electricity and support local reliability. Likewise, during high customer electrical demand or unavailability of electric transmission import capability feeding the Humboldt area, the highly flexible HBGS is available to support the Humboldt area electrical needs (electrical demand and voltage support).

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q004		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q004		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 004**

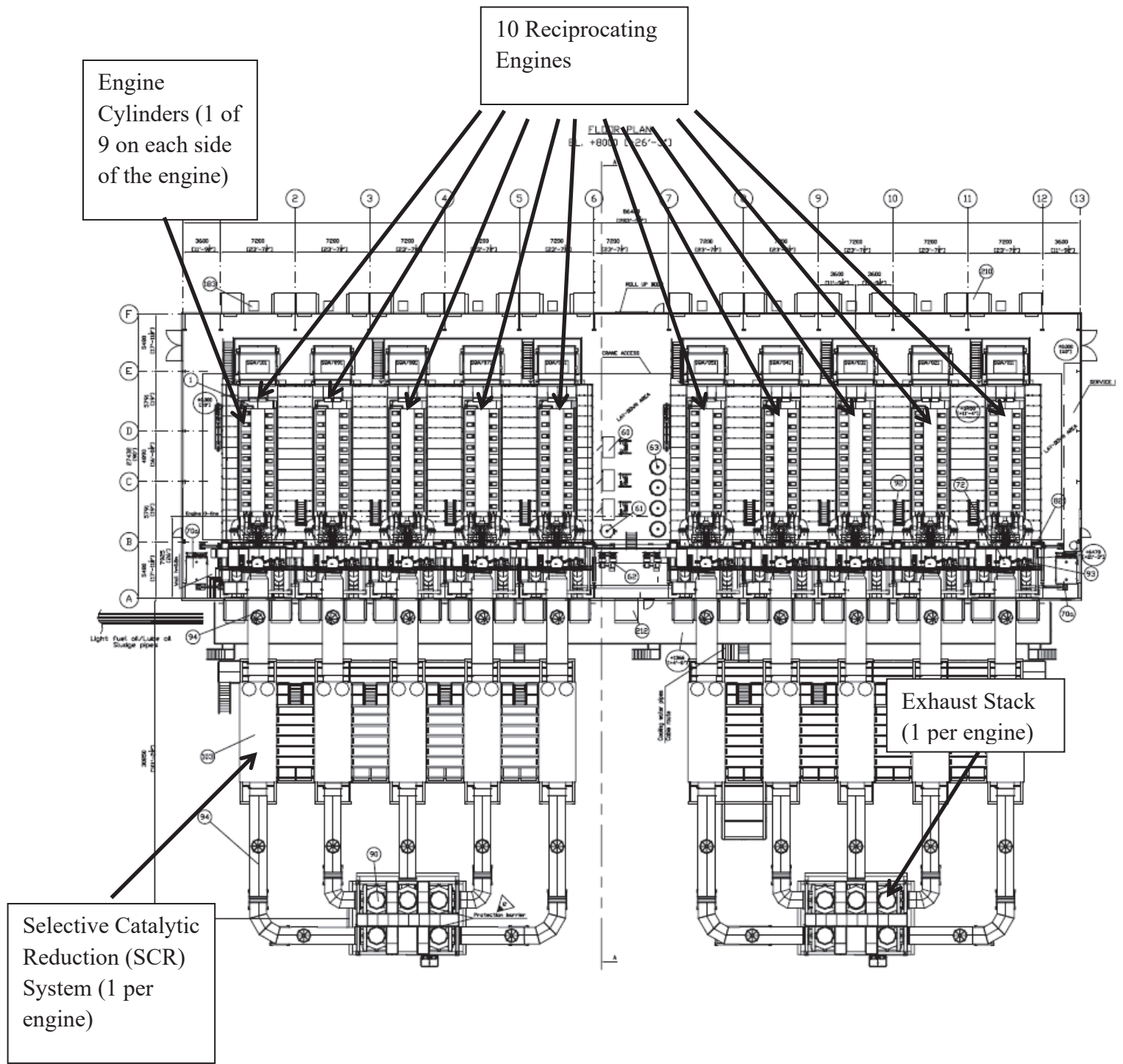
Reciprocating Engines

Please provide a diagram showing the layout of the ten reciprocating engines, and the 18 cylinders. In the diagram, show other generation components not mentioned in PG&E testimony (page 3-3).

**ANSWER 004**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q004Atch01.

## Humboldt Bay Generating Station Engine Layout



**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q005		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q005		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 005**

Reciprocating Engines

Provide a diagram(s) and photograph(s) of a reciprocating engine.

**ANSWER 005**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q005Atch01 for a photo of a reciprocating engine. The diagram is provided in PG&E's response to Question 4.

Attachment: ERRRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q005Atch01



Engine Photo

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q006		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q006		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 006**

Reciprocating Engines

How is a reciprocating engine different from other types of generators, such as a gas turbine?

**ANSWER 006**

The difference between a gas turbine and reciprocating engine is that reciprocating engines convert pressure into rotating motion using pistons while a gas turbine engine uses the pressure from the exploding fuel to turn a turbine.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q007		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q007		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 007**

Reciprocating Engines

Why did PG&E choose a reciprocating engine versus a convention gas turbine for Humboldt?

**ANSWER 007**

PG&E objects to this question on grounds that it requests information outside the scope of this 2021 ERRA Compliance Proceeding, which includes review of PG&E's operation of Utility Owned Generation during the record period 2021.

Without waiving this objection, PG&E responds as follows. The dual-fuel type reciprocating engines were selected for the following reasons:

- Lack of redundancy in the natural gas supply and the risk of natural gas curtailment during cold weather. During emergencies all engines are capable of operating solely on low sulfur distillate fuel.
- The heat rate curve for the dual-fuel type reciprocating engine is relatively flat over the entire load range (0-163 MW). The heat rate for combustion turbines varies greatly with output (higher heat rate at low output).

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q008		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q008		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 008**

Reciprocating Engines

Describe how the engines and the cylinders generate electricity.

**ANSWER 008**

Reciprocating engine uses the expansion of gases to drive a piston within a cylinder and converts the piston's linear movement to a circular (or rotating) movement of a crankshaft to turn a generator to generate power.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q009		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q009		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 009**

Reciprocating Engines

What is the breakdown of the 163 MW nominal capacity among the ten reciprocating engines?

- a. What is the MW capacity of each of the ten units?
- b. Why are there differences among the ten engines, if any?

**ANSWER 009**

- a. The MW capacity of each engine is 16.27 MW.
- b. Each of the 10 engines have the same capacity.

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PG&E Data Request No.:	CalAdvocates_002-Q010		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q010		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 010**

Reciprocating Engines

If one unit is down, can the other 9 units run to generate power? Please explain how each engine performs independently or in concert with the rest.

**ANSWER 010**

Yes. Each engine output is independently connected (connected in parallel) to a common electrical bus which feeds the 60KV distribution or 115KV transmission lines. So, if one engine is out of service, the other engines can operate to provide power to the grid.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q011		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q011		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 011**

Reciprocating Engines

What is a pilot fuel (page 3-3, line 9)? Why is low-sulfur distillate used as the pilot fuel (page 3-3, line 8-9)?

**ANSWER 011**

Burning natural gas in a diesel engine requires the use of either a spark plug or small amount of light fuel oil (LFO) to ignite the natural gas. Operating in dual-fuel mode, each engine is required to utilize California Air Resources Board–certified LFO as pilot fuel to ignite the natural gas burned in the cylinder, in this case low-sulfur distillate.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q012		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q012		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 012**

Reciprocating Engines

How do the reciprocating engines work with low-sulfur distillate or biodiesel? Do they have a different ignition system, pressure, and temperature than natural gas?

- a. What is the generating capacity when sulfur distillate or biodiesel is used instead of natural gas?
- b. Under what circumstances would sulfur distillate/biodiesel be used instead of natural gas? Please describe recent circumstances of their usage and why.
- c. Has the Commission given PG&E authority to run Humboldt using non-natural gas? Please cite.

**ANSWER 012**

Burning natural gas in the engine requires the use of either a spark plug or small amount of LFO to ignite the natural gas. The natural gas enters the engine with the combustion air on the intake stroke, and pilot fuel is injected just prior to the pistons reaching top dead center on the compression stroke. The fuel ignites during compression.

The pilot fuel needed to ignite the gas is extremely small when compared to the amount of natural gas utilized to generate the electricity

- a. There is no change in the generating capacity when low sulfur distillate/biodiesel is used instead of natural gas.
- b. Low sulfur distillate/biodiesel is used in emergency situations when there is a shortage of natural gas. It is also used during annual emission testing.
- c. Yes. Decision 06-11-048 granted PG&E's request for a CPCN for HBGS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q013		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q013		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

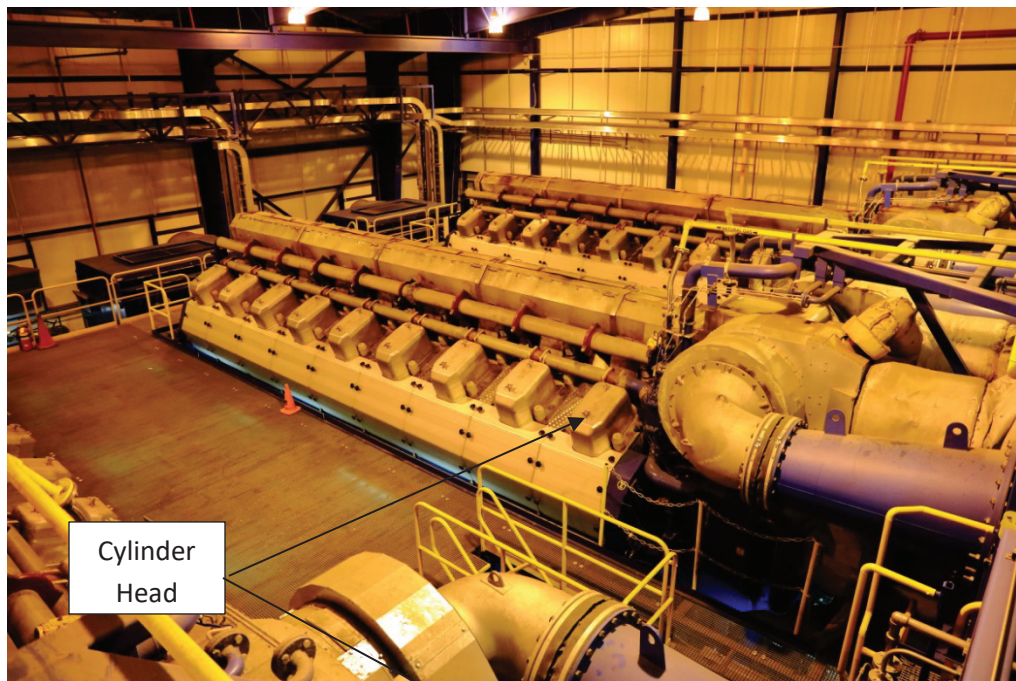
**QUESTION 013**

Reciprocating Engines

How many cylinder heads are there? How are they labeled? Please show them in the diagram.

**ANSWER 013**

There are 18-cylinder heads. They are labeled A1-A9 and B1-B9. Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q013Atch01.



Photos of Cylinder Head

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q014		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q014		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 014**

Reciprocating Engines

Provide the following information for each of the ten reciprocating engines:

	MW	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
Unit #1						
Each unit per line						
Unit #10						

**ANSWER 014**

	MW	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
Unit #1	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #2	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #3	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #4	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #5	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #6	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #7	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #8	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA

Unit #9	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #10	16.27	Warsila	Warsila	Sep 2010	Sep 2011	NA

**PACIFIC GAS AND ELECTRIC COMPANY**  
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PG&E Data Request No.:	CalAdvocates_002-Q015		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q015		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 015**

Reciprocating Engines

If any of the ten units was replaced, please use a new table to update any new unit information, and state the reasons why the replacement occurred.

**ANSWER 015**

No units have been replaced.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q016		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q016		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 016**

Cooling Water

What does the cooling water at Humboldt do (page 3-22, line 14)? Please describe its function.

- a. Which components does the cooling water serve?
- b. Why do those components need to be cooled?

**ANSWER 016**

Humboldt uses a closed-loop water cooling system for each engine. The cooling system removes heat gained from the engines during the combustion process much like the radiator in a car or truck.

- a. The cooling system serves the engine.
- b. The cooling system removes excess heat from the engine, maintains the temperature of the engine to allow it to work efficiently, and brings the engine up to the right operating temperature as quickly as possible. If the cooling system or any part of it fails, the engine can overheat causing engine misfire and eventual engine failure.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q017		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q017		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 017**

Cooling Water

Please describe the different types and the number of cooling systems.

- a. How many types of cooling systems are there in Humboldt? Please explain why there are different types in use.
- b. How many cooling systems of each type are in Humboldt? Please explain the purpose for the number of cooling systems.

**ANSWER 017**

- a. There is a single cooling system for each of the 10 engines at Humboldt and each cooling system is the same type.
- b. See PG&E's response to part a. above. The purpose of the cooling system is discussed in PG&E's response to Question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q018		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q018		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 018**

Cooling Water

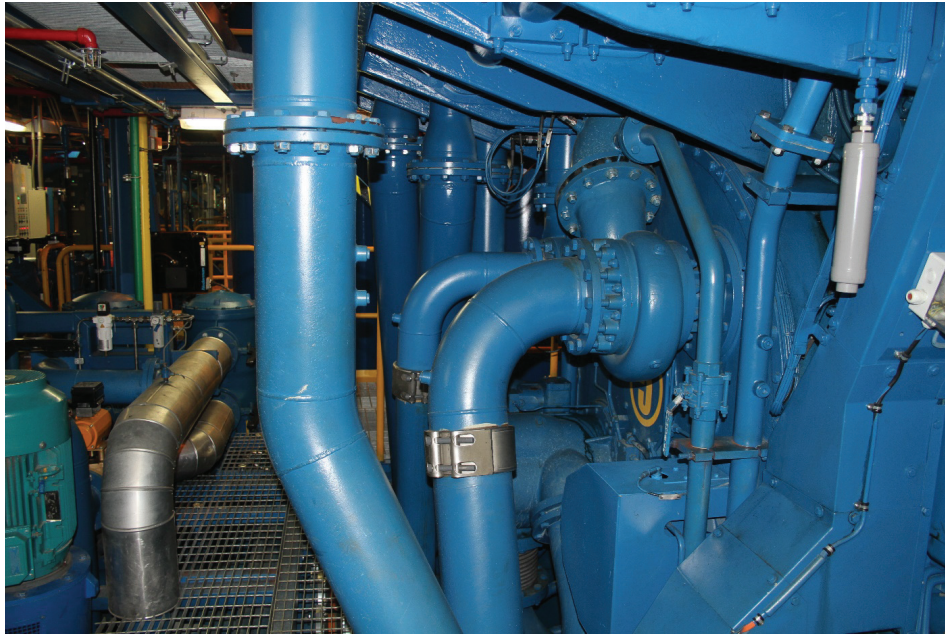
Please provide photos and diagrams of the cooling water systems showing their locations in relationship to the ten reciprocating engines, the 18 cylinders, and other major components of Humboldt.

**ANSWER 018**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q018Atch01 for a photo of the cooling water system.

The diagram of the cooling water system is proprietary to the engine manufacturer, Wartsila. PG&E will supplement this response with the cooling water system diagram if and when Wartsila authorizes PG&E to release the diagram to Cal Advocates.

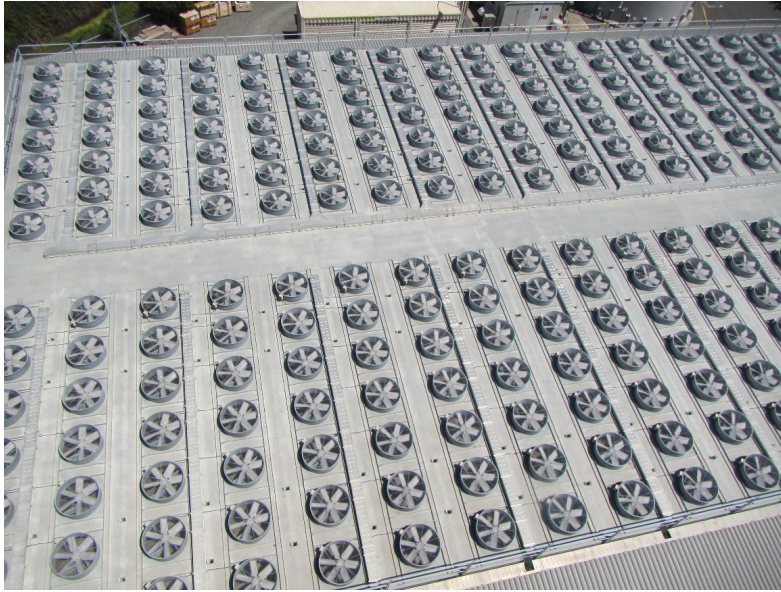
Attachment: ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q018Atch01



Cooling Water System Piping



Cooling Water System Piping



Cooling Water System Fans

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates 002-Q019		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 002-Q019		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 019**

Cooling Water

Provide the following information for each cooling system:

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
System #?					
System #??					
System #???					

**ANSWER 019**

The cooling water system is an integral part of the original engine installation, which was completed by the OEM, Warsila. Warranties are no longer in effect for this original equipment.

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
Unit #1	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #2	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #3	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #4	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #5	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #6	Warsila	Warsila	Sep 2010	Sep 2011	NA

Unit #7	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #8	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #9	Warsila	Warsila	Sep 2010	Sep 2011	NA
Unit #10	Warsila	Warsila	Sep 2010	Sep 2011	NA

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q020		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q020		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 020**

Cooling Water

If any of the cooling systems was replaced, please use a new table to update any new unit information, and state the reasons why the replacement occurred.

**ANSWER 020**

None of the cooling water systems have been replaced.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q021		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q021		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 021**

Emission Control System

What is the purpose of an Emission Control System (ECS) (page 3-3, line 11 and page 3-22, line 3 and 8) at Humboldt? Please describe its function.

**ANSWER 021**

The emission control system is designed to keep the engines in compliance with the requirements of Title 40 Code of Federal Regulations Part 60, the Environmental Protection Agency, North Coast Air Quality Management District, and the California Energy Commission. The permit addresses many pollutants such as NOx and CO emissions.

Emission control is accomplished with Selective Catalytic Reduction (SCR) which is a proven and advanced active emissions control technology system that injects a liquid-reductant agent through a special catalyst into the exhaust stream of the engine. Three catalyst systems are used to reduce NOx, CO, and VOC production.

The SCR system is comprised of two layers of selective catalytic reduction (SCR) catalyst where raw NOx is destructed. The exhaust gas then flows through one layer of NH3 slip catalyst where the excess NH3 is removed. Immediately following the NH3 slip catalyst one row (layer) of oxidation catalyst destructs the raw CO.

The process governing the emission control is managed by a PLC located in a control panel. Each engine has a SCR System and associated control panel.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q022		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q022		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 022**

Emission Control System

Please explain and cite any regulatory laws, statutes, etc.

**ANSWER 022**

Humboldt complies with its Title V Permit number NCU 059-12 (Federal Operating & District Permit to Operate) issued by the North Coast Unified Air Quality Management District.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q023		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q023		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 023**

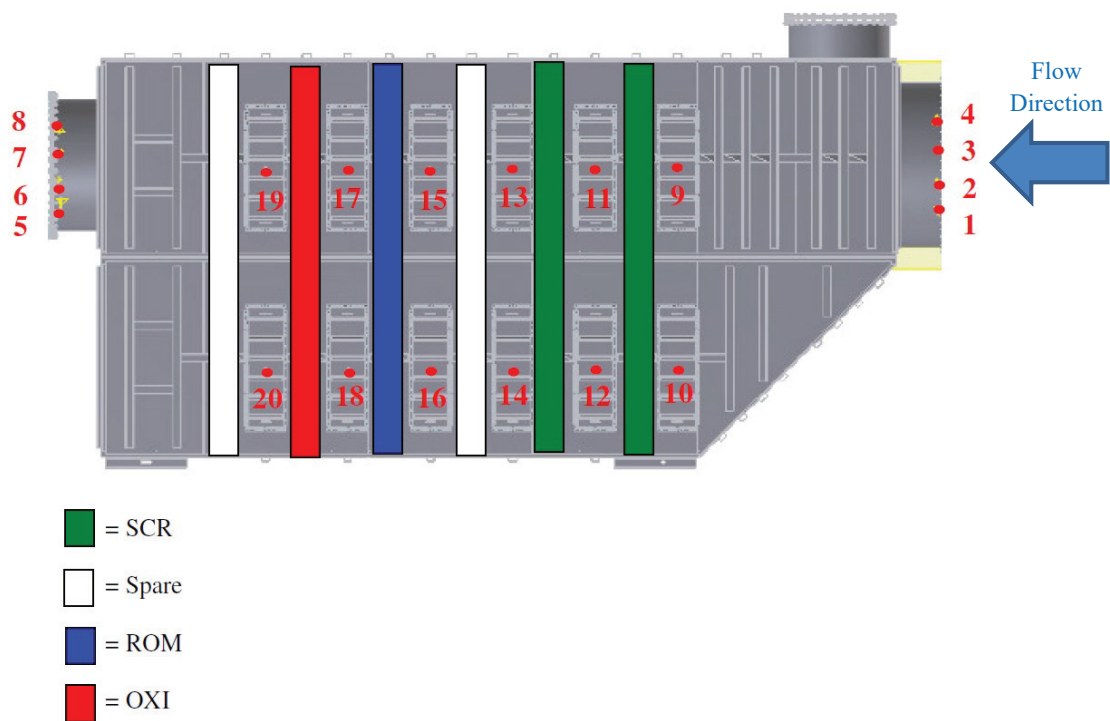
Emission Control System

Provide a diagram(s) and photos of an ECS.

**ANSWER 023**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch01 for a diagram of an ECS.

Refer to Attachments ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch02 and ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch03 for photos of an ECS.



Emission Control Equipment Diagram



Emissions Control Equipment Internal View



Emissions Control Equipment External View

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q024		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q024		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 024**

Emission Control System

With which equipment and/or systems does the EMS interact? Please explain and provide diagrams and photos to illustrate.

**ANSWER 024**

The ECS interacts with the engine. Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q004Atch01 for a diagram showing the layout of the ECSs (labeled as SCRs) in relationship to the engines.

Refer to Attachments ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch01, ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch02, and ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch03 for diagrams and photos of the ECS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q025		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q025		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 025**

Emission Control System

How many ECRs are there at Humboldt? Please provide a diagram showing the layout of the ECSs in relationship to the ten reciprocating engines, the 18 cylinders, and other major components of Humboldt.

**ANSWER 025**

There is one ECS per engine. Please see PG&E's response to question 24.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q026		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q026		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 026**

Emission Control System

Provide the following information for each ECS:

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
ECS #?					
ECS #??					
ECS #???					

**ANSWER 026**

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
ECS for Unit #1	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #2	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #3	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #4	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #5	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA

ECS for Unit #6	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #7	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #8	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #9	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA
ECS for Unit #10	Warsila/ HUG engineering	Warsila/ HUG engineering	Sept 2010	Sep 2011	NA

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_001-Q027		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q027		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 027**

Emission Control System

If any of the ECSs was replaced, please use a new table to update any new unit information, and state the reasons why the replacement occurred.

**ANSWER 027**

No ECSs have been replaced.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q028		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q028		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 028**

Selective Catalytic Reduction

What is the purpose of a Selective Catalytic Reduction (SCR) (page 3-3, line 12 and page 3-22, line 28, 30 and 31) at Humboldt? Please describe its function.

**ANSWER 028**

The SCR is a component of the ECS. Please see PG&E's response to Question 21 for information on the purpose and function of the SCR. The testimony referenced above refers to the SCR housing. The SCR housing encapsulates the SCR system as shown in Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch03.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q029		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q029		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 029**

Selective Catalytic Reduction

Provide a diagram(s) and photograph(s) of an SCR.

**ANSWER 029**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch01 for a diagram of an SCR system and refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch02 and Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch03 for photographs of an SCR system.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q030		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q030		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 030**

Selective Catalytic Reduction

Please cite the standards and regulations with which the SCR needs to comply.

**ANSWER 030**

Please see PG&E's response to Question 22.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q031		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q031		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 031**

Selective Catalytic Reduction

With which equipment and/or systems does the SCR interact? Please explain and provide diagrams and photos to illustrate.

**ANSWER 031**

Please see PG&E's response to Question 24.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q032		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q032		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 032**

Selective Catalytic Reduction

Please describe how the ECS and the SCR interact. Please explain and provide diagrams and photos as appropriate.

**ANSWER 032**

The SCR is a component of the ECS. Please see PG&E's response to Question 24.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q033		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q033		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 033**

Selective Catalytic Reduction

How many SCRs are there at Humboldt? Please provide a diagram showing the layout of the SCRs in relationship to the ten reciprocating engines, the 18 cylinders, and other major components of Humboldt.

**ANSWER 033**

There are two layers of SCR modules per engine. Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q023Atch01 for a diagram.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q034		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q034		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 034**

Selective Catalytic Reduction

Provide the following information for each SCR:

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
SCR #?					
SCR #??					
SCR #???					

**ANSWER 034**

The SCR is a component of the ECS. Warranties are no longer in effect for this original equipment. Please see PG&E's response to Question 26.

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
ECS for Unit #1	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #2	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #3	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #4	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA

ECS for Unit #5	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #6	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #7	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #8	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #9	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #10	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q035		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q035		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 035**

Selective Catalytic Reduction

If any of the SCR's was replaced, please use a new table to update any new unit information, and state the reasons why the replacement occurred.

**ANSWER 035**

No entire SCR systems have been replaced on any of the ten engines.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q036		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q036		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 036**

Programmable Logic Controller

What is the purpose of a Programmable Logic Controller (PLC) (page 3-22, line 5) at Humboldt? Please describe its function.

**ANSWER 036**

A PLC (programmable logic controller), a component of the ECS, is an industrial computer control system that continuously monitors the state of input devices and makes decisions based upon a custom program to control the state of output devices. In this case, the PLC is the brains of the emission control system and is programmed with the appropriate logic to manage the emission controls process.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q037		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q037		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 037**

Programmable Logic Controller

Provide a diagram(s) and photograph(s) of a PLC.

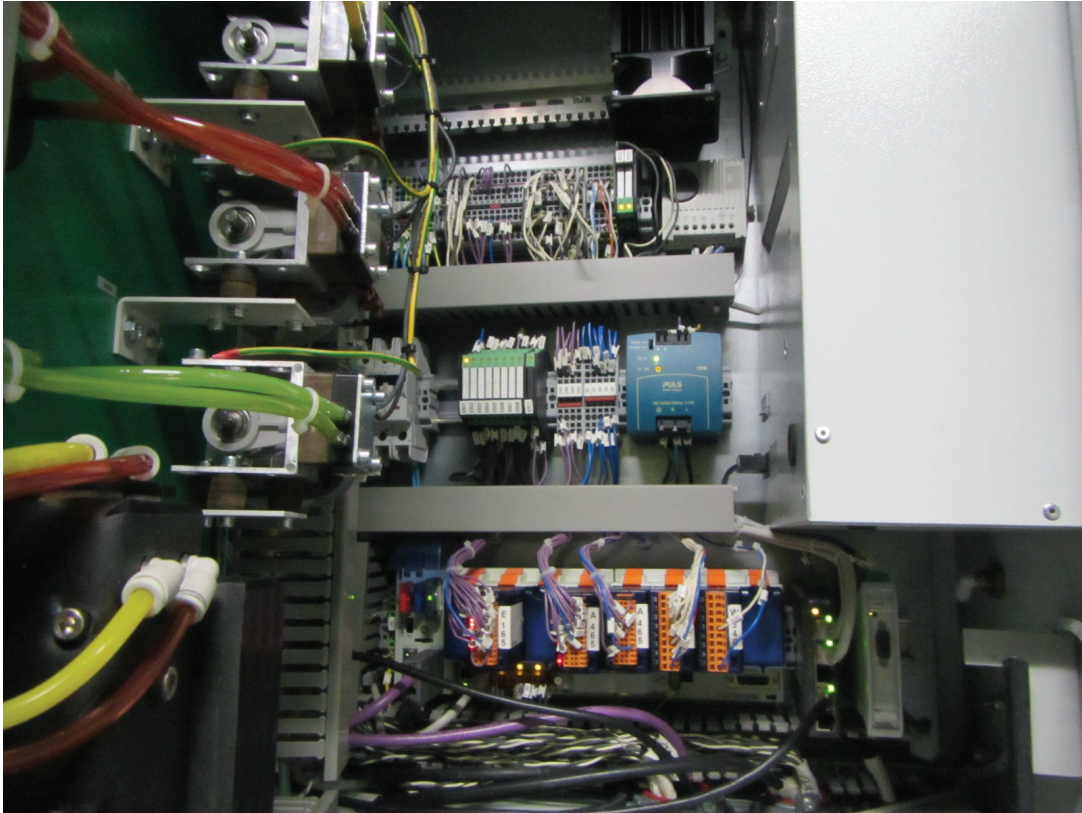
**ANSWER 037**

Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q037Atch01 for photos of a PLC. PG&E does not have a diagram of a PLC readily available.

Attachment: ERRRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q037Atch01.



Emissions Control System Panel



Emissions Control System PLC  
(Internal View of ECS Panel)

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q038		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q038		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 038**

Programmable Logic Controller

Please cite the standards and regulations with which the PLC needs to comply.

**ANSWER 038**

The PLC is a component of the ECS. Please see PG&E's response to Question 22.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q039		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q039		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 039**

Programmable Logic Controller

With which equipment and/or systems does the PLC oversee and interact. Please explain and provide diagrams and photos to illustrate.

**ANSWER 039**

The PLC is a component of the ECS. Please see PG&Es response to Question 24.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q040		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q040		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 040**

Programmable Logic Controller

How many PLCs are there at Humboldt? Please provide a diagram showing the layout of the PLCs in relationship to the ten reciprocating engines, the 18 cylinders, and other major components of Humboldt.

**ANSWER 040**

There is one main ECS control PLC for each of the 10 engines. Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q037Atch01 for a photo of the PLC located inside the ECS control panel. Refer to Attachment ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_002-Q004Atch01 for a diagram of the ECS in relation to the other equipment.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q041		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q041		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 041**

Programmable Logic Controller

Provide the following information for each PLC:

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
PLC #?					
PLC #??					
PLC#???					

**ANSWER 041**

The PLCs are a component of the ECS. Warranties are no longer in effect for this original equipment. Please see PG&E's response to Question 26.

	Installed by	Manufactured by	Date of Installation	Warranty Expiration Date	Extended Warranty Date?
ECS for Unit #1	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #2	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #3	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #4	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA

ECS for Unit #5	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #6	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #7	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #8	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #9	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA
ECS for Unit #10	Wartsila/HUG Engineering	Wartsila/HUG Engineering	Sep 2010	Sep 2011	NA

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_002-Q042		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_002-Q042		
Request Date:	March 22, 2022	Requester DR No.:	002
Date Sent:	April 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 042**

Programmable Logic Controller

If any of the PLCs was replaced, please use a new table to update any new unit information, and state the reasons why the replacement occurred.

**ANSWER 042**

No PLCs have been replaced with newly procured PLCs. The failed PLC on Unit 2 was replaced with a PLC from inventory of the same vintage as the failed PLC.

## **CHAPTER 3**

### **ATTACHMENT 3.2**

**PG&E Response to Cal Advocates Data Request 12,  
Question 1 to 102 inclusive**

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q001		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q001		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**Humboldt Bay Forced Outage – Unit 2 (Page 3-22)**, February 8, 2021 at 2:20 p.m., to February 13, 2021 at 6:10 p.m. (7.16 days, or 7 days 3 hours and 50 minutes)

**QUESTION 001**

Please verify the dates and times of the above outage duration. Table 3-3 (page 3-21) shows the outage duration as 7.16 days: this information agrees with that provided in the narrative on page 3-22, and in the MDR response to question 1.1.13 (Excel file ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_MDR001-Q13Atch01). Has there been any change to the outage information since the testimony was filed on February 28, 2022? If so, please explain why.

**ANSWER 001**

The Humboldt Bay Forced Outage started on February 6, 2021, at 2:20 p.m., and ended on February 13, 2021, at 6:10 p.m. as documented in Table 3-3 page 3-21, line 2-11 of page 3-22, and in the MDR response to question 1.1.13 in attachment ERRA-2021-PGE Compliance\_DR\_CalAdvocates\_MDR001-Q13Atch0. PG&E cannot locate where a start date of February 8, 2021, has been stated.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q002		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 002**

Why did PG&E use North American Electric Reliability Corporation (NERC) Event Type U1 for this outage (Reference: Excel spreadsheet for MDR #1.1.13 response)? Please explain and cite source.

**ANSWER 002**

The North American Electric Reliability Corporation (NERC) Generation Availability Data System (GADS) defines U1 as an immediate unplanned, or forced, outage. This is an outage that requires immediate removal of the unit from service, another outage state, or a reserve shutdown state (p. III-8, NERC GADS Data Reporting Instructions, Effective January 2020). The Humboldt Unit 2 forced outage met the NERC GADS definition of a U1 outage.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q003		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q003		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 003**

Why did PG&E use the Generating Availability Data System (GADS) Cause Code 5999 (Other miscellaneous diesel engine problems) for the Humboldt Bay Unit 2 outage since the outage was caused by the failure of the programmable logic controller? (Reference: Excel spreadsheet for MDR #1.1.13 response)? Please explain and cite source.

**ANSWER 003**

PG&E used NERC cause code 5999 as this cause code best represented the cause of the outage when the operator entered the event into the system.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q004		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q004		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 004**

PG&E reports this outage as a NERC Event Type U1 and a GADS Cause Code 5999. What are the differences in organization and functions between NERC and GADS with respect to their reporting purpose and requirements?

**ANSWER 004**

Generation Availability Data System (GADS) is NERC's official reporting system for collecting information about the performance of electric generating equipment.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q005		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q005		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 005**

Besides outages, are there any other events for which PG&E must assign and report NERC Event Types and GADS Cause Codes?

**ANSWER 005**

Yes. There are two Event Types that are reported in GADS: Inactive and Active. The Inactive Event Type includes Inactive Reserve, Mothballed, and Retired. The Active Event type includes U1, U2, U2, SF, D1, D2, D3, D4, DM, PD, DM, MO, ME, PO and PE. For a description of these Event Types, please reference the NERC GADS Data Reporting Instructions at <https://www.nerc.com/pa/RAPA/gads/Pages/Data%20Reporting%20Instructions.aspx>.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q006		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q006		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 006**

To whom does PG&E report the NERC Event Types and GADS Cause Codes? Please list all persons/organizations (external to PG&E) that receive the information.

**ANSWER 006**

PG&E reports the NERC Event Types and GADS Cause Codes each quarter to NERC consistent with the NERC GADS Data Reporting Instructions referenced in PG&E's response to Question 5. PG&E also provides this information to the CPUC and various parties in PG&E's CPUC proceedings upon request.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q007		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q007		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 007**

Where is the requirement that PG&E must identify and report the NERC classification and GADS cause code for the outage?

**ANSWER 007**

PG&E is uncertain what Cal Advocates means by “NERC Classification”. The requirement to report NERC event types and NERC cause codes is specified in the NERC GADS Data Reporting Instructions. As of January 1, 2013, GADS reporting became mandatory for conventional generating units that are 20 MW and larger.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q008		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q008		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 008**

Where is the requirement, if any, that PG&E must identify and report the NERC classification and GADS cause code for the outage to other persons/organizations (external to PG&E)?

**ANSWER 008**

Refer to PG&E's response to question 7.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q009		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q009		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

NERC Classification and GADS Cause Code (DR response to #1.1.13 Attachment 01)

**QUESTION 009**

Is PG&E required to provide follow-up reports/information to the persons/organizations that receive the NERC and the GADS information? How about other entities that did not receive PG&E report of the NERC Event Types and GADS Cause Codes. If so, please provide copies of all such follow-up reports and correspondences for the Humboldt Bay Unit 2 outage.

**ANSWER 009**

PG&E does not know what Cal Advocates is referring to by follow-up reports/information.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q010		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q010		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

February 6, 2021 Startup (page 3-22, line 3)

**QUESTION 010**

Why was Unit 2 started up on February 6, 2021? Did it start up to provide energy for market demand, to carry out a performance check after a maintenance shutdown, or to accomplish some other functions? Please explain.

**ANSWER 010**

The unit was called upon from reserve shutdown for operation from CAISO.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q011		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q011		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

February 6, 2021 Startup (page 3-22, line 3)

**QUESTION 011**

If there was a shutdown just prior to the February 6, 2021 startup, please provide the reasons and details for the shutdown.

**ANSWER 011**

The unit was in reserve shutdown.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q012		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q012		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 012**

What does it mean that the emission control system (ECS) failed to operate as required (page 3-22, line 3 to 4)? Explain what is “required”

**ANSWER 012**

The PLC inside the ECS failed causing a loss of communication. The ECS is designed to reduce engine emissions to required levels as specified in the Title V air permit.

Refer to PG&E’s response to Cal Advocates Data Request 02, Question 22 for additional details on the ECS design requirements.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q013		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q013		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 013**

What are the functional components of the ECS? Please describe those components, and provide diagrams and photos to illustrate.

**ANSWER 013**

Refer to PG&E's response to Cal Advocates Data Request 02, Question 21.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q014		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q014		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 014**

Which components fail to operate? Please explain the nature of their failures that led to their inoperability.

**ANSWER 014**

Refer to PG&E's response to Question 12.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q015		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q015		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 015**

Which EMS components would cause the unit to not start up? Please explain why.

**ANSWER 015**

PG&E does not know what Cal Advocates means by EMS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q016		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q016		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 016**

Please explain how often those components are inspected, and explain the rationale for the frequency of inspections.

**ANSWER 016**

The PLC is an internal component of the ECS and there is no physical inspection or testing that occurs on the PLC itself by PG&E or the OEM.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q017		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q017		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 017**

Please provide the desktop procedures or any other in-house procedures that describe those inspections

**ANSWER 017**

Refer to PG&E's response to question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q018		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q018		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 018**

Please describe what problems were found during inspections in the past, the reasons for the problems, and the corrective actions implemented.

**ANSWER 018**

There have been no problems found with the ECS PLC for any of the Humboldt engines.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q019		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q019		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Emission Control System

**QUESTION 019**

Please provide records of those inspections from the last two years. If the interval of inspections exceeds one year, provide the last two cycles of inspections.

**ANSWER 019**

Please see PG&E's response to Question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q020		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q020		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 020**

What is a Programmable Logic Controller (PLC)? Please explain its function.

**ANSWER 020**

Refer to PG&E's response to Cal Advocates Data Request 02, Question 36.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q021		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q021		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 021**

What does the PLC control?

**ANSWER 021**

Refer to PG&E's response to Cal Advocates Data Request 02, Question 36.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q022		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q022		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 022**

Is there a PLC for each of the ten units at Humboldt Bay?

**ANSWER 022**

Refer to PG&E's response to Cal Advocates Data Request 02, Question 40.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q023		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q023		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 023**

Please provide photos and diagrams of the PLC showing its location in relationship to the ten reciprocating engines, the 18 cylinders, and other major components of Humboldt.

**ANSWER 023**

Refer to PG&E's response to Cal Advocates Data Request 02, Questions 37 and 40.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q024		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q024		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 024**

Please provide the name and address of the PLC original equipment manufacturer (OEM).

**ANSWER 024**

The PLC is an electrical subcomponent of the ECS panel which is manufactured by HUG engineering. HUG engineering US office is located at 830 West 450 South Columbus, IN 47201. The PLC was manufactured by SAIA.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q025		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q025		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 025**

Please explain why the PLC failed. Describe the software or the hardware issue that led to its failure.

**ANSWER 025**

There was an internal fault in the PLC causing it to fail.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q026		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q026		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 026**

Does PG&E have a software reliability program? If so, please describe the software reliability program.

**ANSWER 026**

PG&E does not understand what Cal Advocates means by software reliability program. The software program for the ECS does not require updates. The forced outage was a result of an electronic hardware failure, specifically the PLC.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q027		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q027		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 027**

Does the software reliability program encompass the problem related to the PLC failure in February 2021? Please provide a copy of the software program, and identify the section(s) pertaining to the February 2021 problem.

**ANSWER 027**

Refer to PG&E's response to question 26.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q028		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q028		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 028**

Describe the previous incidents of the PLC failure. Provide records and other documentation related to those incidents.

**ANSWER 028**

No ECS PLC failures have occurred previously on any of the Humboldt Engines.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q029		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q029		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 029**

What corrective actions were performed in those previous incidents?

**ANSWER 029**

Refer to PG&E's response to question 28.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q030		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q030		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 030**

If PG&E does not have the software reliability program, please explain why not.

**ANSWER 030**

Refer to PG&E's response to question 26.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q031		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q031		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 031**

Does the OEM and/or PG&E perform testing on the PLC?

**ANSWER 031**

Refer to PG&E's response to question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q032		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q032		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 032**

Please provide the desktop procedures or any other in-house procedures that describe that PLC testing.

**ANSWER 032**

Refer to PG&E's response to question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q033		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q033		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 033**

Please describe what problems were found during testing in the past, the reasons for the problems, and the corrective actions implemented.

**ANSWER 033**

Refer to PG&E's response to question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q034		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q034		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 034**

Please provide records of the testing from the last two years. If the interval of testing exceeds one year, provide the last two cycles of testing.

**ANSWER 034**

Refer to PG&E's response to question 16.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q035		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q035		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 035**

When were the two spare PLCs originally programmed?

**ANSWER 035**

The two spare PLCs were not programmed in advance of the forced outage. PG&E does not have the capability to program the PLC's. PG&E's vendor programs the PLCs once it is determined which unit the PLC will be installed on.

**PACIFIC GAS AND ELECTRIC COMPANY**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q036		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q036		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 036**

Why did the two spare PLCs require reprogramming? Was there a fault in the original programming? Please explain.

**ANSWER 036**

Each ECS PLC is specifically programmed for a given unit. A spare PLC had to be programmed to replace the failed PLC on Unit 2. The failure was not a result of programming issues.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
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**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q037		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q037		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 037**

How many times have the two spare PLCs been reprogrammed? Please explain.

**ANSWER 037**

The spare PLCs had not been programmed prior to this event.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q038		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q038		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 038**

Was the failed PLC programmed to the same specifications as the two spare PLCs?  
Please explain the history of the failed PLC's programming.

**ANSWER 038**

Yes, the spare PLC was programmed using the same OEM specifications of the failed PLC.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q039		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q039		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 039**

What was the disposition of the failed PLC? Could it not be salvaged?

**ANSWER 039**

The PLC was disposed of as E-waste.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q040		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q040		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 040**

Did PG&E test the two spare PLCs after they had been reprogrammed? If so, please furnish records of the reprogramming.

**ANSWER 040**

HUG engineering programmed the PLC and PG&E installed the PLC and confirmed ECS communication was reestablished, and ammonia controls were functioning as intended with no alarms. The records of the programming are embedded in the PLC.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q041		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q041		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 041**

Which of the two spare PLCs did PG&E use to replace the failed PLC? Please explain the choice.

**ANSWER 041**

There was no difference between the two spare PLCs.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q042		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q042		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 042**

Why did PG&E maintain two spare PLCs? Please explain, and provide the bases for that decision.

**ANSWER 042**

Spares were maintained for life cycle management, in the event a PLC failed.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q043		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q043		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 043**

Did PG&E replace one spare PLC after the other spare PLC was used to exchange the failed PLC?

**ANSWER 043**

After this PLC failure, PG&E purchased two spare PLCs for each of the ten units. Each of these spare PLCs were programmed for a specific unit.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q044		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q044		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 044**

Did PG&E consider maintaining more spare PLCs before the February 6, 2021 outage?

**ANSWER 044**

No, because no PLCs had failed prior to the PLC failure on Unit 2. All PLCs are original equipment from initial commissioning of the engines in 2009.

**PACIFIC GAS AND ELECTRIC COMPANY  
2021 Energy Resource Recovery Account Compliance  
Application 22-02-015  
Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q045		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q045		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 045**

Did PG&E consider maintaining more spare PLCs after the February 6, 2021 outage?

**ANSWER 045**

Yes. Two spare PLCs were purchased and programmed for each of the ten units.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q046		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q046		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 046**

Why were the two spare PLCs not previously reprogrammed so that they would be ready to replace the failed PLC immediately?

**ANSWER 046**

Wärtsilä, the engine OEM, or HUG engineering, the ECS control system OEM, did not recommend or provide additional spares.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q047		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q047		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Programmable Logic Controller

**QUESTION 047**

Are all the PLCs in the ten Humboldt Bay units programmed identical? Please explain, and if there are differences, describe the differences among them.

**ANSWER 047**

No. Each PLC is programmed for the specific emission control requirements of each unit.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q048		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q048		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Chronology of Outage

The following questions seek information to determine the reasonableness of the outage duration:

**QUESTION 048**

Please describe how the outage and equipment failure happened in chronological order, and provide the amount of time spent for each activity, and the total amount of time spent for all activities. (A table format for this response is preferred.)

For example (please list all other relevant event items not mentioned below):

- i. There was an outage on <provide date> and the following tasks were performed:
  - a. Replaced <specify items replaced> and dates and time spent.
  - b. Repaired <specify items repaired> and dates and time spent; and
  - c. Reworked <specify items reworked> and dates and time spent.
- ii. At the conclusion of the outage work on <provide date>, PG&E noted the following issues <provide specifics and explanations>.
- iii. On <date>, PG&E started the following repair work:
  - a. PG&E did this <please enumerate> for this amount of time spent; and
  - b. PG&E did that <please enumerate> for this amount of time spent, etc.

**ANSWER 048**

Date	Activity Description
2/6/21 - 2/7/21	While in reserve shutdown, indication received on ECS loss of communication. Cycled communication power to reset ECS but still received alarm. Investigated the HUG engineering ECS control panel and determined PLC was not functioning.
2/7/21 - 2/8/21	Contacted HUG engineering and shipped spare PLC to HUG engineering for programming.
2/8/21 - 2/11/21	HUG engineering programmed PLC for Unit 2
2/11/21 – 2/12/21	Shipped programmed PLC back to Humboldt
2/12/21-2/13/21	PG&E installed the programmed PLC and confirmed ECS communication was reestablished, and ECS loss of communication indication cleared. Unit was paralleled for service for short period of time for online testing with no issues found.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q049		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q049		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

**Chronology of Outage**

The following questions seek information to determine the reasonableness of the outage duration:

**QUESTION 049**

What tests/inspections did PG&E and/or its contractor(s) perform at the conclusion of the repair to assure that the work was done correctly? Please include the time spent.

**ANSWER 049**

PG&E confirmed the ECS communication was re-established, the loss of communication indication to the ECS was cleared, paralleled the unit for online testing, and confirmed the ECS was operating as expected.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q050		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q050		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 050**

How were the operators alerted of the failure?

**ANSWER 050**

The ECS loss of communication alarm was initiated.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q051		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q051		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 051**

Did the operators manually shut down the facility?

**ANSWER 051**

The unit was in reserve shutdown at the time the alarm was received. The start-up was aborted by the operator.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q052		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q052		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 052**

Explain how the operator shut down the unit.

**ANSWER 052**

Refer to PG&E's response to question 51.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q053		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q053		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 053**

What is/are the interlocking device(s) that shut down the engine? Are there any Instrumentation and Controls (I&C) devices which control the shutdown? Please explain.

**ANSWER 053**

No. There are no I&C devices that shut the unit down on ECS loss of communication alarm. The ECS is designed to not trip the unit on alarm so the operators can assess the alarm and manually make adjustments to reduce emissions levels to stay within operating limits. If they are unable to resolve the emission issue, the engine can be shutdown using the shutdown command on the operator interface control screen.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q054		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q054		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 054**

Did the facility shut down automatically, and was it due to the interlocking software?  
Please explain.

**ANSWER 054**

Refer to PG&E's response to question 53.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q055		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q055		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 055**

Was there an interlocking software that causes the unit to shut down when a specific EMS component fails? If so, please enumerate what those components are, and explain why the failures of those components necessitate the shutdown of the unit.

**ANSWER 055**

Refer to PG&E's response to question 53.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q056		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q056		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 056**

Was there an interlocking software that causes the unit to shut down when a specific EMS component fails? If so, please enumerate what those components are, and explain why the failures of those components necessitate the shutdown of the unit.

**ANSWER 056**

Refer to PG&E's response to question 53.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q057		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q057		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 057**

What are the set points and/or operating characteristics that cause the facility to shut down? Who established those set points/operating characteristics, and why?

**ANSWER 057**

PG&E objects to this question as overly broad and burdensome.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q058		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q058		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 058**

What did PG&E and/or its contractor(s) need to test before the unit was returned to service on February 13, 2021? Please explain and provide a diagram and photograph(s) of the all the parts and components that PG&E and/or its contractor(s) needed to test.

**ANSWER 058**

Refer to PG&E's response to question 49.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q059		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q059		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 059**

Please explain what aspects/features of the PLC failure necessitated Humboldt Bay Unit 2 to shut down.

**ANSWER 059**

Refer to PG&E's response to question 12.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q060		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q060		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 060**

Please explain whether Humboldt Bay Unit 2 would be able to run if the operator(s) manually operates the unit when the PLC fails. Provide reasons as to why the operator(s) chose not to operate manually or why the operator(s) was(were) unable to operate manually.

**ANSWER 060**

A Humboldt Bay unit would not be operated with a failed PLC due to the loss of the ability to control emissions of the engine via the ECS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q061		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q061		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 061**

Could the PLC in an adjacent unit not be used simultaneously for Unit 2 when Unit 2 PLC failed? Please explain.

**ANSWER 061**

No. Refer to PG&E's response to Cal Advocates DR No. 02 Question 40. Each engine has its own ECS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q062		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q062		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 062**

Why was there no online backup system or online backup controller? Who made the decision not to install any backup apparatus?

**ANSWER 062**

An online backup system or online backup controller is not consistent with industry practice for this specific application. The ECS was designed and installed as part of Humboldt Bay plant construction completed by Wärtsilä. HUG was the OEM who designed the ECS. The determination would be made by the OEMs that a backup PLC would not be required. Spare PLCs were provided and available to be programmed and installed. It is important to note that in the last 14 years of 10 units operating, only one PLC has failed. There is no evidence showing that PLC failures are common and would warrant a back-up control system or PLC.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q063		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q063		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 063**

Please provide the Root Cause Evaluation (RCE) Report for the incident and any other post-mortem reports. If there are no post-mortem documents, please explain why.

**ANSWER 063**

There was no RCE report prepared for this incident.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q064		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q064		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 064**

Please enumerate all the parts and components that failed.

**ANSWER 064**

The ECS PLC on Unit 2 failed.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q065		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q065		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 065**

What factors contributed to the failure of the various parts and components?

**ANSWER 065**

Refer to PG&E's response to question 25.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q066		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q066		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 066**

Prior to the outage on February 6, 2021, were there any regularly-scheduled inspection and maintenance requirements for the failed items as enumerated in your response to question #64. Are any inspections and maintenance activities currently underway or scheduled for the near future? Please explain.

**ANSWER 066**

Refer to PG&E's response to question 16, 17, 18, and 19.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q067		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q067		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 067**

For comparison, please provide color photos of the failed items provided in your response to question #64 before usage and at the time of failure. Please label the parts.

**ANSWER 067**

Refer to PG&E's response to Cal Advocates DR No. 02 Question 37 and 40.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q068		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q068		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 068**

Were there any regularly-scheduled inspection and maintenance requirements for the above items in the other fossil units? Are any inspections and maintenance activities currently underway or scheduled for the near future? Please explain.

**ANSWER 068**

Humboldt is the only reciprocating engine power plant in PG&E's fossil portfolio. The ECS is unique to Humboldt engine emission control requirements; therefore, inspection and maintenance activities would not be comparable to the combined cycle fossil plants in PG&E's portfolio.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q069		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q069		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Unit Shutdown and Restoration

**QUESTION 069**

Did PG&E experience a similar type of outage previously in its fossil portfolio? Please explain.

**ANSWER 069**

No.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q070		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q070		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Post Mortem

**QUESTION 070**

If there was a similar type of outage previously, why was this incident repeated?

**ANSWER 070**

Refer to PG&E's response to Question 69.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q071		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q071		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Alva Svoboda	Requester:	Nicholas Hwang/ Karl Stellrecht

Replacement Power Cost

(Please provide the response in an Excel spreadsheet, and also show the replacement power cost calculations. Provide sources for numbers, and show cell formulae if the numbers pertain to computation from different cell data. Please use the outage time requested in question #1.)

**QUESTION 071**

What was the replacement power cost during the outage? If the cost was zero or negative, please explain. (Do not respond, “refer to spreadsheet.” State the cost in the answer sheet, and identify the Excel cell number where the cost may be found.)

**ANSWER 071**

***THE ATTACHMENT TO THIS DATA RESPONSE CONTAINS CONFIDENTIAL INFORMATION PROTECTABLE UNDER DECISION 06-06-066, AND/OR PUBLIC UTILITIES CODE SECTION 454.5(G) – SUBJECT TO NDA***

During the Humboldt Unit 2 outage period from February 6, 2021, to February 13, 2021, there was an estimated replacement cost of \$37,676. PG&E provides a detailed cost analysis as Attachment 1 to this data response (see Excel spreadsheet “ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_012-Q071\_Atch01\_CONF.xlsx”). The final replacement energy cost of \$37,676 can be found in cell D9 of the tab titled “Summary.”

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q072		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q072		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Warranty

**QUESTION 072**

Who originally manufactured the parts that failed? If the original parts were replaced on one or more occasions, please identify all the vendors. Provide the date(s) and time(s) when the parts were installed.

**ANSWER 072**

Refer to PG&E's response to question 24 and 28.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q073		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q073		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Warranty

**QUESTION 073**

What is the warranty period of the damaged parts in question?

**ANSWER 073**

Refer to PG&E's response to TURN Data Request 02, Question 41.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q074		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q074		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Warranty

**QUESTION 074**

Did PG&E pursue compensation (equipment and replacement power cost) for the outage from the manufacturer or other vendors?

- a. If so, please provide all documentation.
- b. If not, please explain why not.

**ANSWER 074**

No.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q075		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q075		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Cost Recovery

**QUESTION 075**

What was the Commission-approved depreciation life and depreciation rate for the damaged parts in question?

**ANSWER 075**

PG&E objects to this question on grounds that it is outside the scope of this proceeding. Subject to and without waiving that objection, PG&E responds as follows. The Commission-approved 2021 depreciation accrual rate is 3.55 percent for PG&E's FERC account 343 for Other Production: Prime Movers.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q076		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q076		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Cost Recovery

**QUESTION 076**

What was the Application and Decision number that dealt with the depreciation life and depreciation rate?

**ANSWER 076**

PG&E objects to this question on grounds that it is outside the scope of this proceeding. Subject to and without waiving that objection, the 2020 GRC decision, D. 20-12-005, approved the depreciation parameters.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q077		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q077		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Cost Recovery

**QUESTION 077**

How much did it cost PG&E to replace the damaged parts? Please provide the cost breakdown (labor, materials, etc.) and workpapers for each. If there are numerous cost items less than \$100,000, please group them in the appropriate categories.

**ANSWER 077**

PG&E objects to this request to the extent that it seeks information that is beyond the scope of issues in this proceeding. Subject to and without waiving that objection, PG&E responds as follows. Operation and maintenance costs and capital costs for PG&E's utility owned generation, among other things, are recovered in rates established in PG&E's General Rate Case. The cost to replace the PLC was approximately \$2,721.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q078		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q078		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Equipment Cost Recovery

**QUESTION 078**

How does PG&E intend to seek cost recovery for this repair? If PG&E has already recovered the cost of the repair, please provide the associated Application and Decision number.

**ANSWER 078**

As discussed in PG&E's response to Question 77, the repair was performed using funds collected in customer rates approved by the CPUC in PG&E's General Rate

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q079		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q079		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 079**

Please explain how PG&E replaced the failed PLC.

**ANSWER 079**

PG&E simply disconnected the failed PLC and replaced it with the spare PLC after it was programmed.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q080		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q080		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 080**

Explain how the failed PLC was discarded. Please also address the environmental issues associated with such work and disposal.

**ANSWER 080**

Refer to PG&E's response to question 39.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q081		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q081		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 081**

Please enumerate the government/regulatory agencies that regulate the emissions of Humboldt Bay, and the responsibility of each government agency.

**ANSWER 081**

Refer to PG&E's response to Cal Advocates Data Request 02, Question 22.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q082		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q082		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 082**

What emission violations occurred during the PLC failure?

**ANSWER 082**

No emission violations occurred as a result of the PLC failure.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q083		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q083		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 083**

Please provide all reports submitted to the various government/regulatory agencies regarding the February 2021 failure.

**ANSWER 083**

No reports are required to be submitted to government/regulatory agencies regarding the Unit 2 forced outage.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q084		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q084		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 084**

Please provide all reports submitted by the various government/regulatory agencies regarding the February 2021 failure.

**ANSWER 084**

PG&E is not aware of any reports submitted by any government/regulatory agencies regarding the Unit 2 forced outage.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q085		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q085		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 085**

Was PG&E cited? Please provide all citations from the various government/regulatory agencies.

**ANSWER 085**

No.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q086		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q086		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 086**

Please provide the names and addresses of the contractors, if any, involved in the outage, including the corrective actions.

**ANSWER 086**

Hug Engineering - 830 West 450 South Columbus, IN 47201

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q087		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q087		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 087**

Please specify the scope of work for each contractor.

**ANSWER 087**

HUG engineering was the only contractor involved in the outage. They programmed the PLC.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q088		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q088		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 088**

Please explain how PG&E selected each contractor for the work.

**ANSWER 088**

HUG engineering was the OEM for the ECS.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q089		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q089		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 089**

Please enumerate what parts/items PG&E replaced during the shutdown to restore Humboldt Bay Unit 2 back in service. Please provide the picture(s) and/or diagrams of the parts/items, and label them.

- a. If not all failed parts/items were replaced, please explain why not.
- b. If non-failed parts/items were replaced, please explain why.

**ANSWER 089**

Refer to PG&E's response to Cal Advocates Data Request 02, Questions 37 and 40.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q090		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q090		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 090**

Was the repair or rework approved? If so, by whom?

**ANSWER 090**

Yes, the installation of the programmed PLC was approved by local plant management.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q091		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q091		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 091**

If the approver(s) for the repair/rework was not the same as the original designer, please explain who had the authority to approve the work.

**ANSWER 091**

PG&E has plant technicians on site who can replace a PLC, which is common electrical hardware. The programming of the PLC requires specialized equipment and specific expertise which is why it was performed by the OEM

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q092		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q092		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 092**

Were the parts installed in the repair/rework identical to the original design specifications? Please explain.

**ANSWER 092**

Yes.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q093		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q093		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 093**

Please provide the documentation and/or inspection report when the replaced parts/items were installed and all associated tests performed before the unit was returned to service.

**ANSWER 093**

Inspection reports are not generated for the replacement of a failed PLC. PG&E personnel confirmed the ECS communication was re-established, and the indication was cleared which was noted in operator logs.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q094		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q094		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 094**

Did PG&E inspect the integrity of the other fossil units? Please explain, and provide records of inspection. Please list all the parts and items replaced in the other fossil units, and state where those items are indicated in the inspection reports. Please identify who replaced the parts and items.

**ANSWER 094**

No, this was an isolated issue and specific to an electrical component failure within the ECS panel at Humboldt Unit 2.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q095		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q095		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Correction Plan

**QUESTION 095**

Please explain the amount of time (7.16 days) that PG&E took to repair the above-mentioned damages:

- a. Please provide the schedule/timeline and the amount of outage time for each milestone activity. Additionally, please provide the total amount of outage time for all milestone activities. (The total amount of all milestone activities should be the same as your response to question #48 on the sum of all activity durations.)
- b. Could something be done to streamline repairs in the future?
- c. Please explain whether PG&E has stocked the different failed parts in the warehouse to reduce the downtime for repair
- d. Did PG&E perform any benefit/cost study to determine whether it was cost effective to warehouse the above and/or other items which led to this outage? If yes, please provide the study. If not, please explain.

**ANSWER 095**

- a. Refer to PG&E's response to question 48.
- b. Yes. PG&E has stocked two spare programmed PLCs for each engine to minimize downtime in the event of a ECS PLC failure in the future.
- c. Refer to PG&E's response to part b.
- d. A formal benefit/cost study was not conducted.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q096		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q096		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 096**

Please enumerate what parts/equipment were replaced during the shutdown to restore Unit 2 back in service. Please provide the picture(s) and/or diagrams of the parts/equipment, and label them.

- a. If not all faulty parts/equipment were replaced, please explain why not.
- b. If functioning parts/equipment were replaced, please explain why.

**ANSWER 096**

Please refer to PG&E's response to question 89.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q097		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q097		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 097**

Was the repair or rework approved? If so, by whom?

**ANSWER 097**

Please refer to PG&E's response to question 90.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q098		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q098		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 098**

If the approver(s) for the repair/rework was not the same as the original designer, please explain who had the authority to approve the work.

**ANSWER 098**

Please refer to PG&E's response to question 91.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q099		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q099		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 099**

Were the parts installed in the repair/rework identical to the original design specifications? Please explain.

**ANSWER 099**

Please refer to PG&E's response to question 92.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q100		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q100		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 100**

Please provide the documentation and/or inspection report when the replaced parts/items were installed and all associated tests before the unit was returned to service.

**ANSWER 100**

Please refer to PG&E's response to question 93.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q101		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q101		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 101**

Did PG&E inspect the integrity of the other fossil units? Please explain, and provide records of inspection.

**ANSWER 101**

Please refer to PG&E's response to question 94.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates_012-Q102		
PG&E File Name:	ERRA-2021-PGE-Compliance_DR_CalAdvocates_012-Q102		
Request Date:	May 10, 2022	Requester DR No.:	012
Date Sent:	June 10, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Steve Royall	Requester:	Nicholas Hwang/ Karl Stellrecht

Other Corrective Actions

**QUESTION 102**

Please provide all corrective actions performed or to be performed to prevent the recurrence of similar incidents, including scheduled inspections and maintenance.

**ANSWER 102**

Two spare PLCs were purchased and programmed for each of the ten units.

## **CHAPTER 3**

### **ATTACHMENT 3.3**

**PG&E Response to Cal Advocates Data Request 12,  
Question 71.**

**(CONFIDENTIAL)**

**Attachment  
(Available via email only)**

## LIST OF ATTACHMENTS FOR CHAPTER 5

#	Attachment	Description
1	5.1 <b>PARTIALLY CONFIDENTIAL</b>	Abridged collection of PG&E responses to Cal Advocates data requests cited in testimony.
2	5.2 <b>CONFIDENTIAL</b> (Available by E-mail only)	PG&E's response to Master Data Request questions 1.2.8 and 1.2.9
3	5.3 <b>CONFIDENTIAL</b>	Vantage PPA, provided by PG&E to Cal Advocates in response to data request 7, question 7.
4	5.4 <b>PARTIALLY CONFIDENTIAL</b>	A2002009 Abridged Cal Advocates' Prepared Testimony for the PG&E 2019 Record Period ERRR

## **CHAPTER 5**

### **ATTACHMENT 5.1**

**PG&E Responses to Public Advocates Office Data Requests. Only relevant data request responses included.**

**Abridged to only include portions relevant to  
Cal Advocates Testimony**

**(PARTIALLY CONFIDENTIAL)**

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 007-Q001		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 007-Q001		
Request Date:	April 1, 2022	Requester DR No.:	007
Date Sent:	April 15, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: CHAPTER 9 – CONTRACT ADMINISTRATION**

**QUESTION 001**

Other than non-routine contract amendments, is PG&E seeking Commission approval of any contract executed in the Record Period (those listed in Table 9-1) through the 2021 ERRA Compliance application? If so, please provide the project name, date of execution, and PG&E Log Number.

**ANSWER 001**

No, PG&E is not seeking approval of any contracts executed in the Record Period that are listed in Table 9-1 through the 2021 ERRA Compliance application.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 007-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 007-Q002		
Request Date:	April 1, 2022	Requester DR No.:	007
Date Sent:	April 15, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: CHAPTER 9 – CONTRACT ADMINISTRATION**

**QUESTION 002**

Table 9-6 of PG&E Testimony lists two non-routine amendments that extended milestone dates for the North Fork Community Power (North Fork CP) and Woodland Biomass (Woodland) projects (PG&E Log Number 33R433BIO and 33R493 respectively). For each project, please answer the following:

- a. How did the extension adjust the value of the contract, if at all?
- b. Did the amendments associated with the extensions require PG&E to make or receive any new payments as part of the amendments' terms?
- c. Did the extension to North Fork CP's Guaranteed Commercial Operation Date (GCOD) or Woodland's Expected Initial Energy Delivery Date (EIEDD) also adjust any other contractual milestone dates or the associated contract's expiration date? If so, please list the pre-amendment and post-amendment adjusted milestone and/or expiration dates.
- d. Please provide copies of the contract/Power Purchase Agreement and all amendments for PG&E Log Numbers 33R433BIO and 33R493.

**ANSWER 002**

***The attachments to this data response contain confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G)***

Table 9-6 (Permitted Extensions) of PG&E Testimony lists two Permitted Extensions for the North Fork Community Power (North Fork CP) and Woodland Biomass (Woodland) projects. The extensions for North Fork CP and Woodland are not amendments to the respective power purchase agreements (PPAs); these extensions are allowed under the existing PPAs to extend the contractual milestone dates.

North Fork CP (PG&E Log No. 33R433BIO)

- a) The extension does not alter the value of the contracts.
- b) As noted above, the extension is not an amendment to the agreement. PG&E is not required to make or receive any new payments due to the extension.
- c) The Permitted Extension of the Guaranteed Commercial Operation Date (GCOD) does not impact any other contractual milestone dates and provides additional time for the counterparty to achieve Commercial Operation Date. Section 1.1.2 of the PPA allows for Permitted Extensions for the GCOD.

The contract's expected expiration date is based on when the project achieves Commercial Operate Date under the PPA and the counterparty's election for the delivery term period at the time of PPA execution.

- d) For copies of the Power Purchase Agreement and all amendments, please see the zipped folder, labeled, "ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_007-Q002\_Attachments\_CONF (North Fork\_Woodland)

Woodland Biomass (PG&E Log No. 33R493)

- a) The extension does not alter the value of the contracts.
- b) As noted above, the extension is not an amendment to the agreement. PG&E is not required to make or receive any new payments due to the extension.
- c) The extension of the Expected Initial Energy Delivery Date does not impact any other contractual milestone dates and provides additional time for the counterparty to achieve Initial Energy Delivery Date (IEDD). Section 3.1(c)(ii) of the PPA allows for a one-time notice for a thirty-day extension to the IEDD.

The contract's expiration date is based on when the project achieves IEDD and the delivery term at the time of PPA execution. Under the PPA, Woodland achieved IEDD on September 2, 2021 and has a 5-year delivery term.

- d) For copies of the Power Purchase Agreement and all amendments, see the zipped folder, labeled, "ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_007-Q002\_Attachments\_CONF (North Fork\_Woodland).

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 007-Q003		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 007-Q003		
Request Date:	April 1, 2022	Requester DR No.:	007
Date Sent:	April 15, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: CHAPTER 9 – CONTRACT ADMINISTRATION**

**QUESTION 003**

PG&E terminated four agreements on the basis of [REDACTED]  
[REDACTED] PG&E cites contract authorities that enabled its ability to terminate the contracts in response to Master Data Request Question 1.2.9.4 (ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_MDR001-Q91Atch01-CONF). Please answer the following questions regarding these contract terminations:

- a. For what purpose did PG&E choose to terminate these contracts in the Record Period, [REDACTED]? Why did PG&E not terminate the contracts in prior Record Periods, or continue to maintain the contracts beyond 2021?
- b. Did PG&E contact the counterparties to develop an understanding of why the projects [REDACTED]
- c. How will the termination of these contracts benefit PG&E's ratepayers?

**ANSWER 003**

***This data response contains confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G).***

- a) During the Record Period, PG&E undertook an effort to investigate Qualifying Facility PPAs for non-deliveries to maintain its contract portfolio lists. As a result of this effort, PG&E concluded that the respective facilities would [REDACTED]
- b) PG&E reached out to the respective counterparties ahead of termination. PG&E was able to contact three of the four counterparties, noting the following:
  - Delta Diablo Sanitation (01C103) – [REDACTED]
  - L.P. Reinhard (01W129) – [REDACTED]

- [REDACTED]  
Robert and Joyce Vieux (01W134) – [REDACTED]  
[REDACTED]
- Steven Spellenberg Hydro (19H049) – [REDACTED]  
[REDACTED]

c) There is no perceived impact to PG&E's ratepayers with respect to the terminations given there are no associated costs and benefits due to the statuses of the respective facilities.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 011-Q001		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 011-Q001		
Request Date:	April 28, 2022	Requester DR No.:	011
Date Sent:	May 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 001**

In its response to Cal Advocates Data Request 7, Question 3, PG&E states that during the Record Period, it “undertook an effort to investigate Qualifying Facility PPAs for non-deliveries...”. Was this investigation a part of a routine review process? If so, please state how often this type of investigation occurs. If not, please describe why PG&E chose to pursue this investigation during the Record Period.

**ANSWER 001**

The investigation was not part of a routine review process. However, during the Record Period, PG&E chose to conduct this investigation in an effort to reduce the administrative burden managing non-delivering PPAs.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 011-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 011-Q002		
Request Date:	April 28, 2022	Requester DR No.:	011
Date Sent:	May 12, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**QUESTION 002**

PG&E describes a cost sharing mechanism with Vantage Wind Energy LLC (33R083) at page 9-18 to 9-19 of testimony. Please answer the following:

- a. What are the annual transmission-related costs<sup>1</sup> for the Vantage Wind Energy PPA accrued from October 2010 up to and including the 2017-2018 Contract Year? Please provide an amount for each Contract Year up to and including 2017-2018.
- b. Had the cost sharing mechanism<sup>2</sup> been appropriately applied since October 2010, what would have been the annual dollar amount of Vantage's portion of transmission-related costs from October 2010 up to and including the 2017-2018 Contract Year? Please provide an amount for each Contract Year up to and including 2017-2018.
- c. What was the dollar amount of Vantage's portion of transmission-related costs for Contract Year 2018-2019?
- d. In what Contract Year periods was the contract-specified threshold of the cost sharing mechanism exceeded?
  - i. Cal Advocates interprets the "specified threshold" at PG&E Testimony 9-18 to refer to the three price ranges described in the Vantage Wind PPA Section 3.4(a)(iii): Allocation of Transmission Charges. Please provide a clarification if this interpretation is incorrect.

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<sup>1</sup> As defined by Section 3.4(a) of the PPA.

<sup>2</sup> As described in Section 3.4(a)(iii) of the PPA.

**ANSWER 002**

***This data response contains confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G) and/or the non-procurement declaration dated May 12, 2022 – subject to NDA.***

a.

Year	Contract Year	Total Transmission Charges (\$)
2010/2011	1	
2011/2012	2	
2012/2013	3	
2013/2014	4	
2014/2015	5	
2015/2016	6	
2016/2017	7	
2017/2018	8	

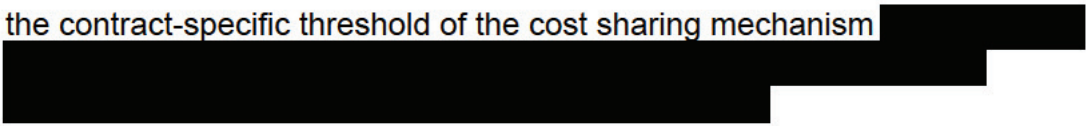
b.

Year	Contract Year	Vantage Cost Share (\$)
2010/2011	1	
2011/2012	2	
2012/2013	3	
2013/2014	4	
2014/2015	5	
2015/2016	6	
2016/2017	7	
2017/2018	8	

c. Vantage's portion of the transmission-related costs for Contract Year 2018-2019 was [REDACTED]

d. PG&E's Testimony 9-18 describes the cost-sharing mechanism for transmission-related costs if costs exceed a contract specified threshold for a given Contract Year. Cal Advocates' correctly references Section 3.4(a)(iii) of the PPA with regards to the three tiers based on transmission-related costs (\$/MWh). Please see PG&E's response to B for Contract Year periods where

the contract-specific threshold of the cost sharing mechanism

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**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 016-Q001		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 016-Q001		
Request Date:	May 16, 2022	Requester DR No.:	016
Date Sent:	May 31, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: DATA REQUEST NO. CAL ADVOCATES A.22-02-015 PG&E - DR No. 13**

**QUESTION 001**

Please provide a description of Hummingbird Energy Storage's force majeure claim and PG&E's reasoning to [REDACTED] the claim described at Table 9-10, Line Number 1. In your description, include the exact reasoning why the counterparty was [REDACTED] [REDACTED] If applicable, in addition to the description of the claim and [REDACTED] include the [REDACTED] [REDACTED] associated with the claim.

**ANSWER 001**

***This data response contains confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G) and/or the non-procurement declaration dated May 31, 2022.***

The counterparty submitted a notice of force majeure citing [REDACTED] [REDACTED] PG&E [REDACTED] the force majeure claims for the [REDACTED] after assessing the information provided by the counterparty in support of its claim and the agreement's force majeure provisions.

The agreement specified an Expected Initial Delivery Date (EIDD) of December 1, 2021, representing the date for which product is to be delivered under the agreement. While the Expected Initial Delivery Date is not adjusted due to the acceptance of the force majeure claim, the acceptance of the force majeure claim grants relief on a day-for-day basis from liquidated damages if the project is delayed past the EIDD. [REDACTED]

[REDACTED] PG&E notes that an amendment was executed on July 6, 2021. The amendment modified the EIDD to July 1, 2023 and extended the contract term, by one year, to sixteen years. With respect to the amendment, PG&E filed Advice Letter 6292-E which was approved on December 16, 2021 per Resolution E-5178.

**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 016-Q002		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 016-Q002		
Request Date:	May 16, 2022	Requester DR No.:	016
Date Sent:	May 31, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: DATA REQUEST No. CAL ADVOCATES A.22-02-015 PG&E - DR No. 13**

**QUESTION 002**

Please provide a description of the counterparty's force majeure claim and PG&E's reasoning to [REDACTED] the claim described at Table 9-10, Line Number 11. In addition to the description, state any delay damages or other financial penalties which the counterparty requested relief for, if the counterparty [REDACTED] and if the counterparty has [REDACTED]

**ANSWER 002**

*This data response contains confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G) and/or the non-procurement declaration dated May 31, 2022.*

The counterparty submitted notice of force majeure for the North Fork Community Power project citing [REDACTED]

PG&E assessed these force majeure claims and granted a 6-month Permitted Extension related to the Transmission Delay, extending the Guaranteed Commercial Operation Date (GCOD) from February 22, 2021, to August 22, 2021, pursuant to Section 1.2.1 of the PPA. [REDACTED] after assessing the information provided by the counterparty relative to the agreement's force majeure and extension provisions. PG&E notes that an amendment was executed as a result of Commission's order pursuant to Decision 20-08-043, which extended the project's GCOD to August 22, 2022. There are [REDACTED]



**PACIFIC GAS AND ELECTRIC COMPANY**  
**2021 Energy Resource Recovery Account Compliance**  
**Application 22-02-015**  
**Data Response**

PG&E Data Request No.:	CalAdvocates 016-Q005		
PG&E File Name:	ERRA-2021-PGE-Compliance DR CalAdvocates 016-Q005		
Request Date:	May 16, 2022	Requester DR No.:	016
Date Sent:	May 31, 2022	Requesting Party:	Public Advocates Office
PG&E Witness:	Candice Chan	Requester:	Nicholas Hwang/ Karl Stellrecht

**SUBJECT: DATA REQUEST No. CAL ADVOCATES A.22-02-015 PG&E - DR No. 13**

**QUESTION 005**

PG&E describes a dispute with South Feather Water and Power Agency (SFWPA) at PG&E Testimony pages 9-16 to 9-17. In reference to that dispute, please provide the following:

- a. A copy of the Settlement Agreement. If the Settlement Agreement is not able to be transmitted in response, please provide a description of PG&E's and SFWPA's initial positions regarding the dispute and how the Settlement Amount was calculated or otherwise found to be a reasonable amount to settle the dispute.
- b. The [REDACTED] amounts in dollars and how those amounts were calculated, in specific reference to PG&E's description (with emphasis by Cal Advocates): [REDACTED]  
[REDACTED]
- c. The value, if any, of the [REDACTED] enabled by the Settlement Agreement,
- d. A description of the length of the Prolonged Outage and how the Prolonged Outage would have extended the PPA Delivery Term based on PG&E's interpretation of the PPA,
- e. A description, and/or copies of relevant correspondence, of SFWPA's reasoning to initiate a dispute for the PPA,
- f. A statement of whether or not the dispute resolution process included third-party arbitration.

**ANSWER 005**

***This data response contains confidential information protectable under Decision 14-10-033, Decision 06-06-066, and/or Public Utilities Code Section 454.5(G) and/or the non-procurement declaration dated May 31, 2022.***

a. For a copy of the Settlement Agreement and related Letter Agreements, please see Attachments 1 and 2 to question 5 of this data response.

See PDF files:

- “ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_013-Q005-Atch01\_CONF”
- “ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_013-Q005-Atch02\_CONF”
- “ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_013-Q005-Atch03\_CONF”



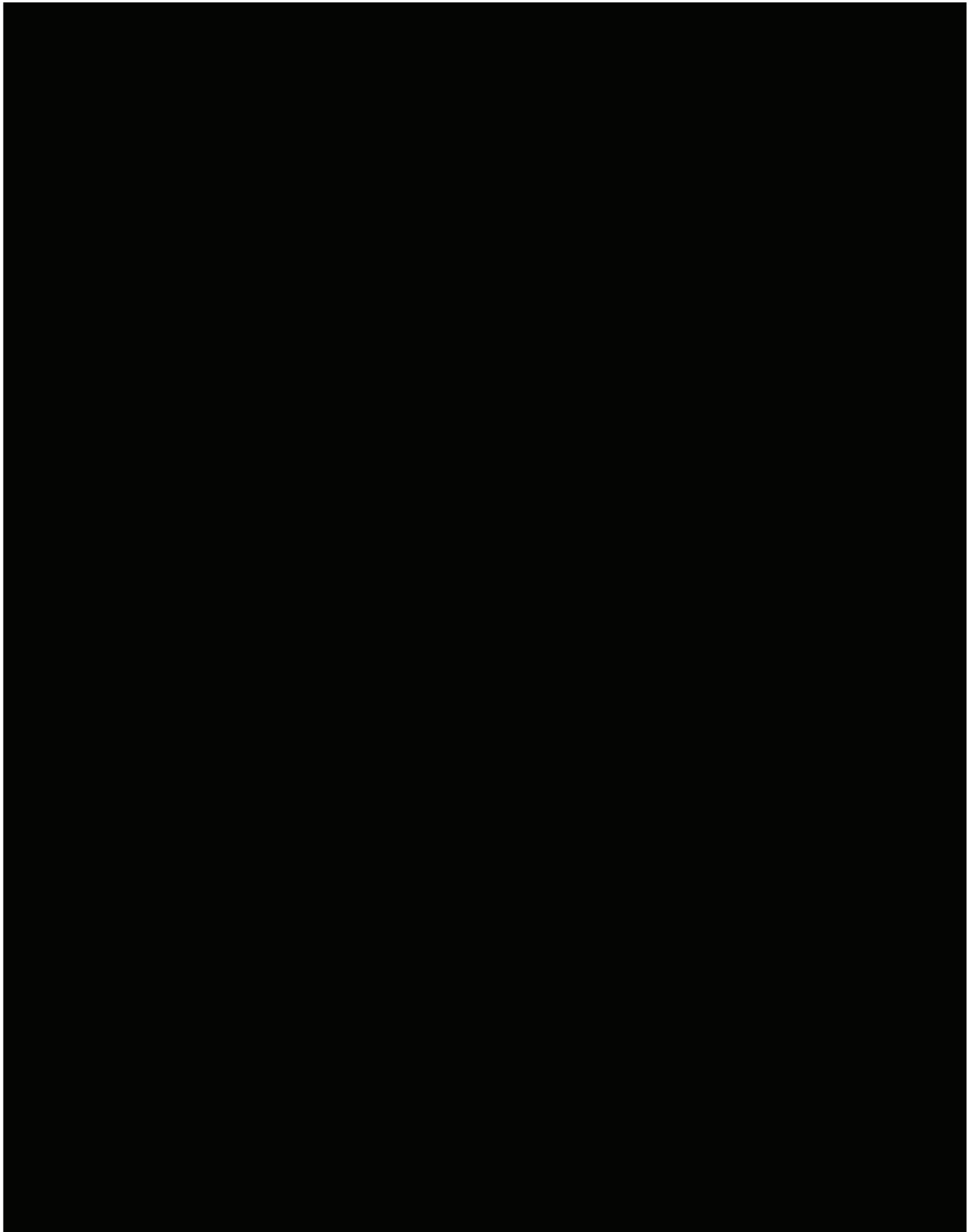
d. The Prolonged Outage began on February 10, 2017 and concluded on July 31, 2018. The delivery term of the contract would extend “day-for-day” relative to the duration of the Prolonged Outage.

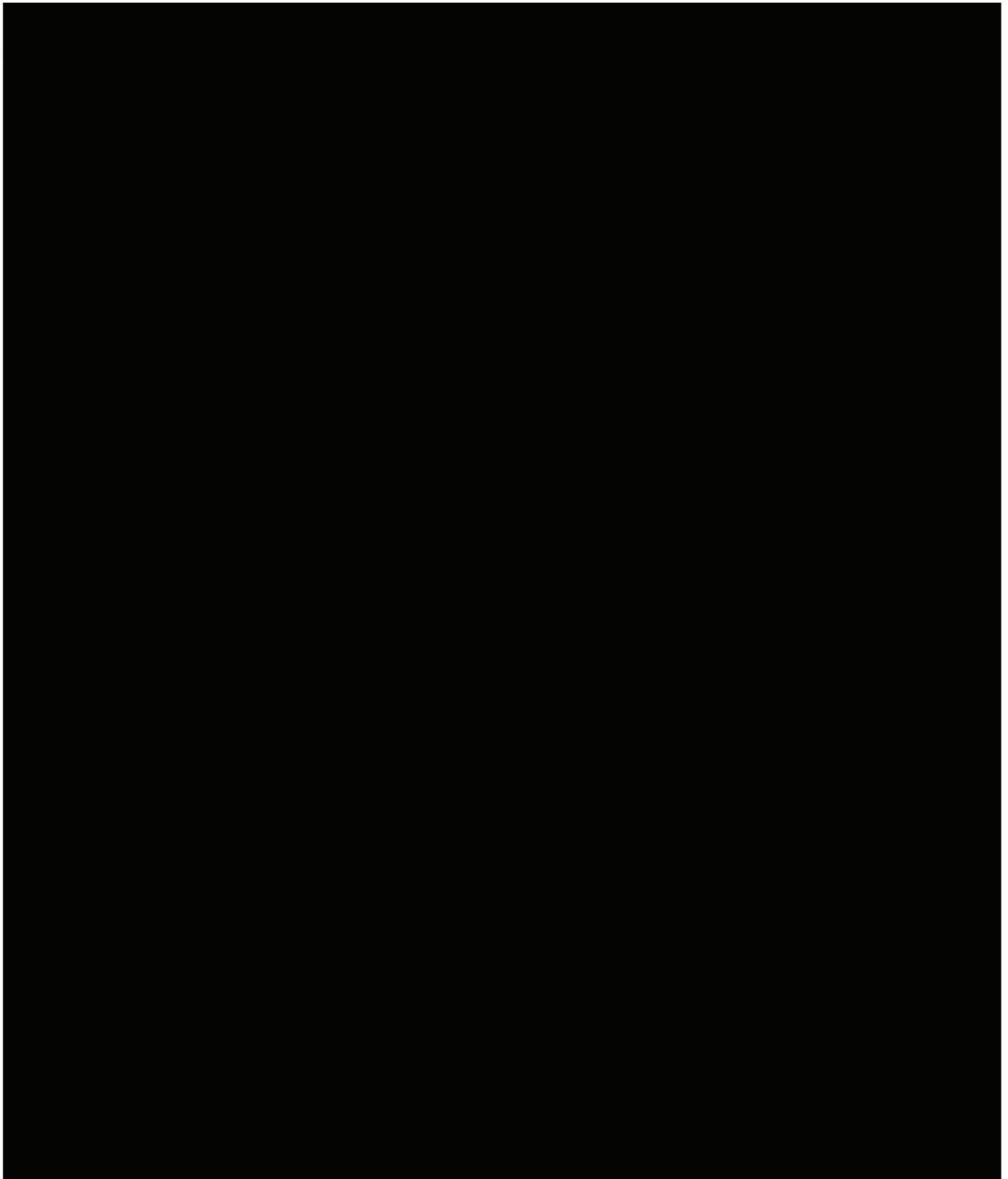
e. For a copy of relevant correspondence providing SFWPA’s reasoning to initiate a dispute for the PPA, please see Attachment 3 to question 5 of this data response.

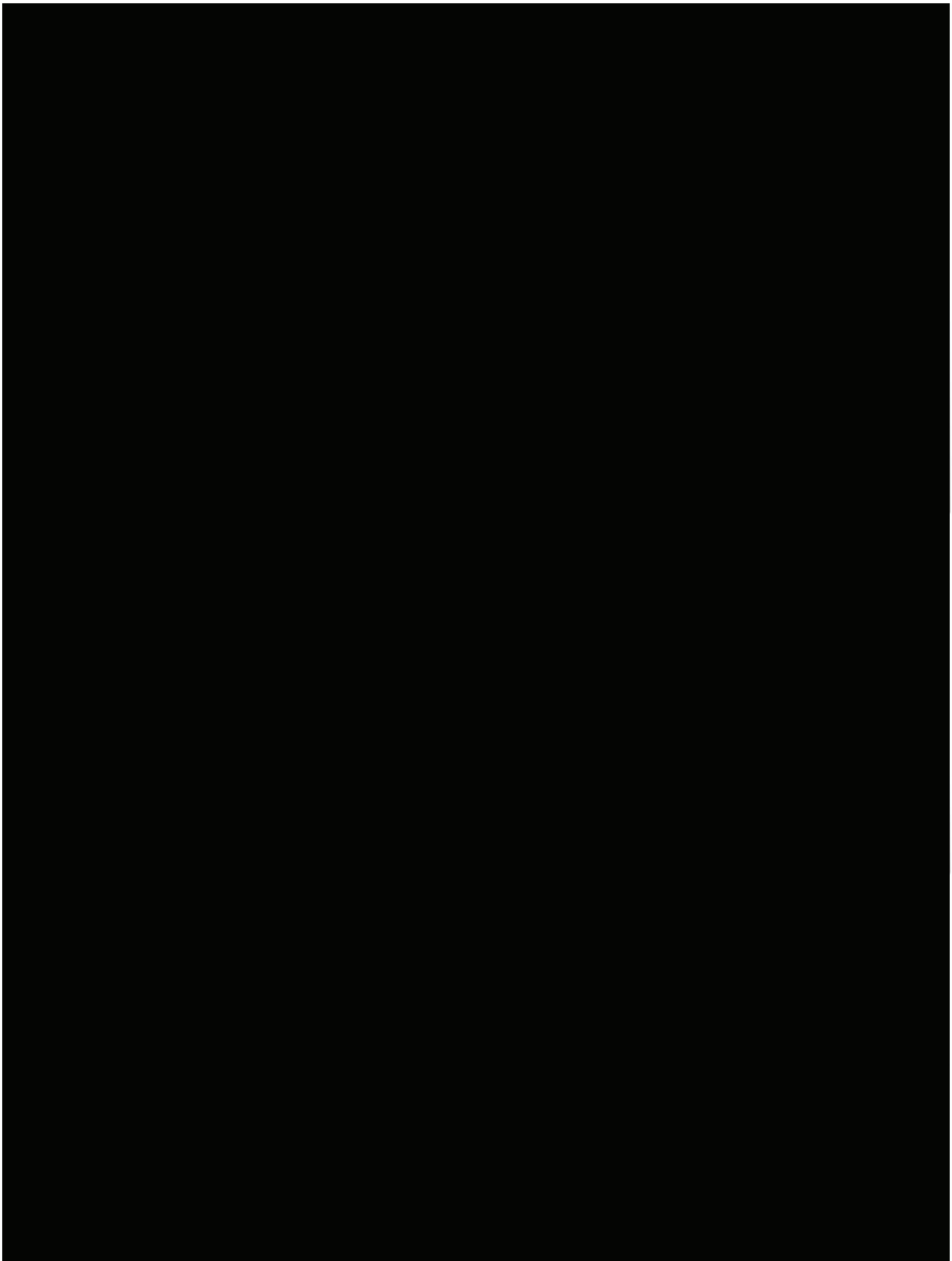
See PDF file:

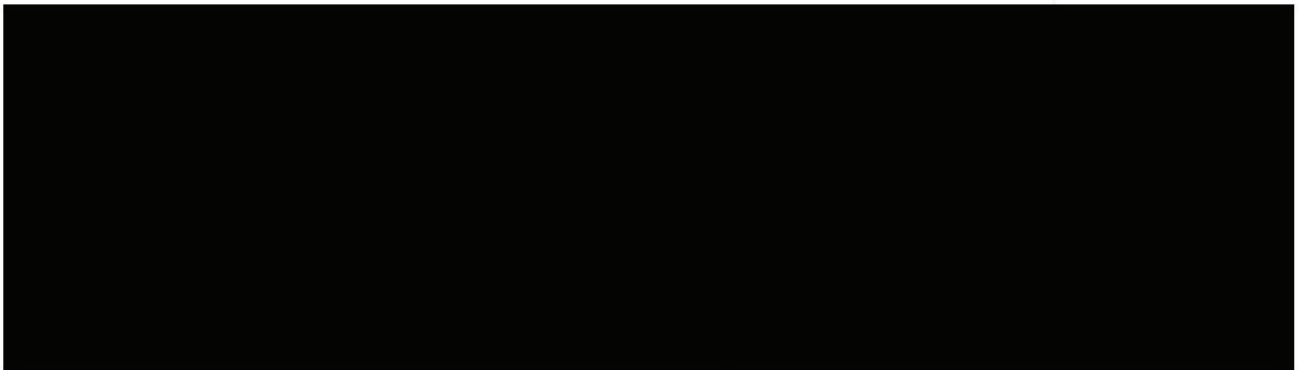
- “ERRA-2021-PGE-Compliance\_DR\_CalAdvocates\_013-Q005-Atch04\_CONF”

[REDACTED]









## **CHAPTER 5**

### **ATTACHMENT 5.2**

**PG&E Responses to the Public Advocates Office  
Master Data Request, Questions 1.2.8 and 1.2.9.**

**(CONFIDENTIAL)**

**(Available by E-mail only)**

## **CHAPTER 5**

### **ATTACHMENT 5.3**

**Full copy of the Vantage PPA, provided by PG&E to  
Cal Advocates in response to data request 7,  
question 7**

**(CONFIDENTIAL)**

## **CHAPTER 5**

### **ATTACHMENT 5.4**

**A2002009 Abridged Cal Advocates' Testimony for the  
PG&E 2019 Record Period ERRR**

**(PARTIALLY CONFIDENTIAL)**

Docket	<u>A.20-02-009</u>
Exhibit Number	
Commissioner	<u>Guzman Aceves</u>
Admin. Law Judge	<u>Elaine Lau</u>
Cal Advocates Project Mgr.	<u>Radu Ciupagea</u>
Cal Advocates Witnesses	<u>Various</u>



**PUBLIC ADVOCATES OFFICE  
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**PREPARED TESTIMONY**

**on**

**Pacific Gas And Electric Company Application  
For Compliance Review Of Utility Owned Generation Operations,  
Portfolio Allocation Balancing Account Entries, Energy Resource  
Recovery Account Entries, Contract Administration, Economic  
Dispatch Of Electric Resources, Utility Owned Generation Fuel  
Procurement, Diablo Canyon Seismic Studies Balancing Account,  
And Other Activities For The Period  
January 1 Through December 31, 2019 (U 39 E)**

**(CONFIDENTIAL VERSION)**

San Francisco, California  
July 10, 2020

1           **A.     Other Matters**

2                   **1.     Thermal Energy Development Corporation (PG&E Log No.**  
3                   **16P054)**

4           PG&E and the Thermal Energy Development Corporation (Thermal Energy), a  
5 biomass facility located in Tracy, CA, are counterparties to a legacy PPA that requires  
6 Thermal Energy to meet its Firm Capacity obligations.<sup>427</sup> In 2014, PG&E notified  
7 Thermal Energy that it had failed to meet its Firm Capacity requirement.<sup>428</sup> By 2016,  
8 Thermal Energy had failed to “cure its probation,” so PG&E derated the facility’s Firm  
9 Capacity level to zero kilowatt-hours (kWh) and demanded \$2,974,197.33 in minimum  
10 damages.<sup>429</sup>

11           Thermal Energy was unable to pay the damages up front but offered to sell the  
12 facility to raise the necessary funds. After finding a potential buyer, in 2018, Thermal  
13 Energy and PG&E entered into a Settlement Agreement and Release that [REDACTED]

14 [REDACTED]  
15 [REDACTED]”<sup>430</sup> After the close of the sale, [REDACTED]  
16 [REDACTED], and the parties terminated the PPA on May 6, 2019.<sup>431</sup> The Public  
17 Advocates Office reviewed the Settlement Agreement and Release and determined that  
18 PG&E executed and resolved its contractual matter with Thermal Energy as a reasonable  
19 manager.

20                   **2.     Vantage Wind Energy LLC (PG&E Log No. 33R083)**

21           PG&E and Vantage Wind Energy (Vantage Winds) are counterparties to a PPA  
22 that “contains a cost sharing mechanism for transmission-related costs in the event such

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<sup>427</sup> A.20-02-009, PG&E Testimony, p. 9-15.

<sup>428</sup> A.20-02-009, PG&E Testimony, p. 9-15.

<sup>429</sup> Settlement Agreement and Release between PG&E and Thermal Energy Development Partnership, L.P., September 13, 2018, p. 1.

<sup>430</sup> A.20-02-009, PG&E Testimony, p. 9-15.

<sup>431</sup> A.20-02-009, PG&E Testimony, p. 9-15.

1 costs exceed a specified threshold for a given Contract Year.”<sup>432</sup> In 2019, PG&E  
2 “discovered that it had not been applying this cost sharing mechanism” since the  
3 beginning of the PPA’s delivery term in 2010.<sup>433</sup> PG&E calculated and invoiced Vantage  
4 Winds for the latter’s share of transmission-related costs for 2017 and 2018, amounting to  
5 [REDACTED], respectively.<sup>434</sup>

6 Although PG&E and Vantage Winds were still “in discussions” as of the end of  
7 Record Period 2019, and “neither party has invoked the PPA’s dispute resolution  
8 process,”<sup>435</sup> the Public Advocates Office examined PG&E’s actions thus far. When  
9 asked in a data request why it overlooked the PPA’s cost sharing mechanism, PG&E  
10 responded that it was due to “unique non-standard settlement provisions in the PPA,” a  
11 lack of process documentation, passing of time, staff turnover, and “inadequate follow-  
12 up.”<sup>436</sup> PG&E noted that none of its PPAs with any other counterparties have a similar  
13 cost sharing mechanism.<sup>437</sup> Finally, when asked why it only calculated Vantage Wind’s  
14 portion of the transmission costs for 2017 and 2018, PG&E responded that it only has  
15 invoices for these two years and is in “active discussions with Vantage Wind regarding  
16 the cost sharing calculations.”<sup>438</sup>

17 Because this issue is ongoing, the Public Advocates Office cannot assess PG&E’s  
18 overall reasonableness as a contract manager. PG&E will report its “progress on this  
19 matter”<sup>439</sup> in its 2020 Record Period ERRR Compliance filing.

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<sup>432</sup> A.20-02-009, PG&E Testimony, p. 9-15.

<sup>433</sup> A.20-02-009, PG&E Testimony, p. 9-15.

<sup>434</sup> A.20-02-009, PG&E Testimony, pp. 9-15 – 9-16.

<sup>435</sup> A.20-02-009, PG&E Testimony, p. 9-16.

<sup>436</sup> PG&E Response to Data Request 11, Question 2a.

<sup>437</sup> PG&E Response to Data Request 11, Question 2b.

<sup>438</sup> PG&E Response to Data Request 11, Question 2d.

<sup>439</sup> PG&E Response to Data Request 11, Question 2f.

**LIST OF ATTACHMENTS FOR CHAPTER 6**

#	Attachment	Description
1	6.1 <b>CONFIDENTIAL</b> (Available via email)	PG&E Response to Cal Advocates Data Request 18, Question 1.
2	6.2 02_RA Portfolio Breakdown Q4 2021 <b>CONFIDENTIAL</b>	PG&E Summary of end-of-record period RA positions, from PG&E AL 6484-E, <i>Procurement Transaction Quarterly Compliance Submittal (Q4, 2021)</i> , Attachment E, January 31, 2022.

## **CHAPTER 6**

### **ATTACHMENT 6.1**

**PG&E Response to Cal Advocates  
Data Request 18, Question 1.**

**(CONFIDENTIAL)**

**Attachment  
(Available via email)**

## **CHAPTER 6**

### **ATTACHMENT 6.2**

**PG&E Summary of end-of-record period RA positions, from PG&E AL 6484-E, *Procurement Transaction Quarterly Compliance Submittal (Q4, 2021)*, Attachment E, January 31, 2022.**

**(CONFIDENTIAL)**